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Rail Road News.

Placing Obstructions on Railways.

We frequently hear of some railway accident caused by the placing of stones, or logs of wood on the track. Of all the crimes of which debased and brutalized mortals can be guilty, none is blacker than this. Those who can be guilty of such a crime are fit for anything in the trade of their master, Satan—and they should be treated in this world, as near as possible to that kind of discipline they will have to undergo in the world to come. They are demons, and unfit to dwell among men. A short time since an outrage of this kind was committed upon the line of the Connecticut River Railroad between Smith's Ferry and Ireland depot. The outrage consisted in placing stones and sleepers across the track in no less than seven different places. The intent was doubtless to throw the train that passed during the evening off the track, but the first obstruction struck by the engine being a decayed sleeper, it was cut in two and the alarm being given, the train proceeded slowly along with a good look-out and was able to escape the dangers prepared for it by the bloody miscreants who were guilty of the outrage.

Road Across the Isthmus of Tehuantepec.

A stage road across this Isthmus, belonging to Mexico, is now nearly completed, and stage coaches will soon be running on it from the Atlantic to the Pacific. A line of steamers will yet run from this city, and it will yet be found that this is the most important route to our California Territories, because it is the shortest of all by 2000 miles. A railroad is contemplated across this route, and an Agent from Mexico has been in this city during the past summer, making arrangements for its construction.

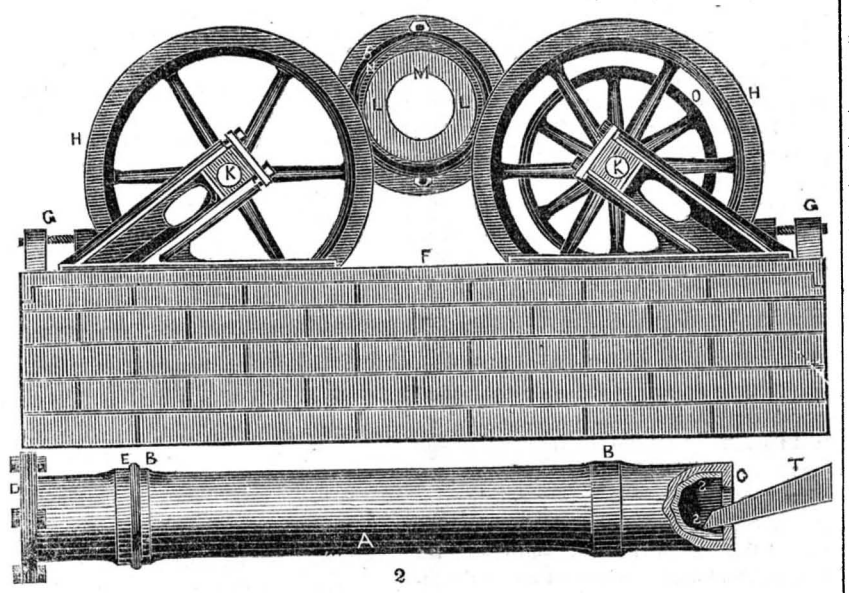
Sub Bituminous Coal for Locomotives.

Some of our railroads, we hear, are experimenting with soft coal. It is time that wood was dispensed with by our railroads. Our forests, vast though they be, deserve a better fate than to be eat up by the iron horse, when fuel from beneath the surface of the earth will do just as well.

A Balloon Frozen.

Two gentleman a short time since, ascended in a balloon from Bedford, England, and when at an elevation of two miles, they got into a cloud of sleet and snow, and the balloon was quickly covered with ice. The gas soon began to expand; but in trying the valve, above and below, it was found to be frozen. In this emergency, they applied a knife, and made an incision of twenty-four inches, in the silk. The gas issued forth in one continuous stream, through a two-foot opening; and singular to relate, the gas that had been passed into the silken globe, an invisible vapor, rushed out as white as the steam from a steam engine; such was the effect of the frosty air upon the gas.—And thus the æronants were rescued from the jaws of destruction. They decended safely.

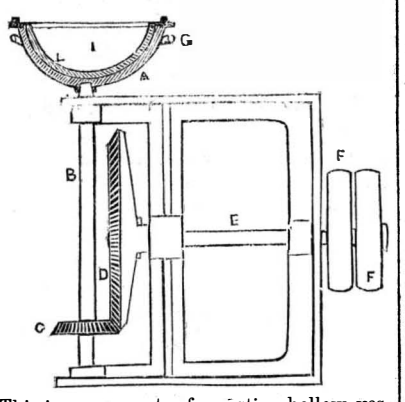
MOULDING PIPES WITHOUT CORES.---Fig. 1.



This invention is the subject of a recent patent, in England, by Mr. Andrew Shanks, an engineer in London; a description of it first appeared in the London Patent Journal. By the articles upon "Iron Moulding," which have already appeared in the Scientific American, it is known by all our readers that cores have to be prepared of the size of the hollow part of pipes, &c., that are moulded in the usual way. The metal is cast around the core, which is afterwards destroyed. This process is the cause of great expense, and the object of this invention is to dispense with cores altogether, by causing the metal while it is fluid, to assume the required form, by centrifugal force, by giving the mould a rotary motion, which is kept up till the metal is set to retain the form imparted, when it is removed from the mould.

Figure 1 is an end elevation of the apparatus employed, and fig. 2 is a longitudinal view of the mould, with different letters on it from the transverse section, seen between the two wheels, H H, fig. 1. A A, fig. 2, is the mould or flask, represented as cut across by L L, fig. 1. It is made with two raised parts, B B, which are turned concentrically true. It is a simple iron mould box, with an internal flange, M, which answers for a core, as is there exhibited. The mould box is mounted between the peripheries of four wheels (two seen) H H, which are placed at suitable distances apart to correspond with the raised parts (B B, fig. 2,) *b*, fig. 1; K K are the shafts of these wheels. They are placed on angular bearing blocks, to increase or shorten the distance between them, by setting screws, G G; F is a plate on the top of the frame, for the bearing blocks to work on. Motion is communicated to one of the shafts, by a band from any suitable power passing over the rigger or pulley, O. The frictional contact with the wheel and mould box, causes it to rotate and to communicate motion to the other wheel, H. To keep the mould box snug in its position, a small bead (E, fig. 2,) is received into a recess on the periphery of each wheel, H; D is a moveable flange on the mould box, for the purpose of removing the casting. T is a spout to convey the molten metal, S S, to the mould-box—this is done while the mould is in motion. A sufficient quantity is poured in to form the casting, which, by the centrifugal force, is thrown outwards to the exterior of the mould box, as shown at N, fig. 1, in which position it is retained by the rotary motion, until the metal is set, when the mould box is removed from the driving wheels, and the casting withdrawn, which is easily done by the contraction of the metal.

FIG. 3



This is an apparatus for casting hollow vessels. A mould box, A, of the desired shape, is mounted on a vertical spindle, B, which derives a rapid rotary motion by means of the wheel and pinion, C, D; the axis, E, of the wheel being driven by the ordinary strap riggers F. The mould, A, is furnished with a conical hole, fitting on to the upper end of the spindle, B, which produces sufficient friction to carry the mould, at the same time admitting of the mould being lifted off when desired, for which purpose two handles, G G, are provided; the top of the mould is fitted with a moveable flange, H: the metal is thus retained during the rotary motion, by which the upper lip or edge of the casting is produced. The metal in a fluid state, is poured into the centre of the mould, and the machine set in motion; or it may be run in while the mould is in motion, its rotation causing the fluid metal, I, by the centrifugal force produced by the motion imparted to it, to depart from the centre, the motion of the mould being so regulated as to insure the proper thickness of metal throughout. All the moulds whether made of iron only, or if lined with loam or other material, should be warmed before the metal is introduced, to prevent it from *setting* too rapidly.

New York Valuation.

The valuation of the property of the city of New York for the present year is, real, $197,761, 119, personal, $58,455,174, total, $256,217,093. This shows an increase over the valuation of last year of $4,732,848 in the real estate, and a decrease in the personal estate of $2,709,276. The decrease in personal estate is accounted for by the removal of families from the lower part of the city to the adjacent towns, and perhaps still more by the fact that each ward elects its own assessors by popular vote, and the interest of the assessors is not to overvalue the property of their constituents. The rate of taxation is $1 18 on the $100.

Useful Receipts.

Cure of Cancer.

The extract of wood sorrel, used as a plaster through the day, and slippery elm bark at night, will cure any cancer that has ulcerated or that has not live skin over it; the skin should be broken in some way. To burn a piece of punk on the place, is a good method, then apply the salve, as before directed. The extract is obtained simply by pounding the common sorrel in a morter, or other vessel, and pressing out the juice, then put it in a pewter dish or basin, and place it in the sun, until it dries to the consistence of tar, when it is fit for use.

[The above we select from an exchange, and we do not endorse it, but merely at present what is held to be good for this inveterate evil. Oxalic acid would answer as well, as the sorrel, in our opinion. We have seen a receipt recommending a poultice of cranberries for the same disease, and it may be that this acid, oxalic, which has been found in both, possesses some great virtue to cure the cancer.

To Preserve Meat for Voyages.

Much has been said about preserved meats spoiling: I preserved some in the following manner: Have the meat cooked and packed in well made tin boxes, and well soldered, except a very small hole in the centre of the top; set them on a stove or some suitable place, and when the steam is up take a bit of fusible metal and a small size cork to press the metal on to the hole, when it melts and stops the steam: chill with cold water. The collapsing or concavity of the heads indicate if the work is well done.

To open them for use set them on a stove and of course they vent themselves. I opened some in 28° South latitude, and the last a few days ago, which were as good as when put up. I don't know how others put it up. H. C.

Comparative Weight, Fusibility, Malleability, Tenacity, and Ductability of Metals.

SPECIFIC GRAVITY.—Platinum, Gold, Mercury, Lead, Silver, Bismuth, Copper, Iron, Tin, Zinc, Antimony.

FUSIBILITY.—Mercury, Tin, Bismuth, Lead, Zinc, Antimony, Silver, Copper, Gold, Iron, Platinum.

MALLEABILITY.—Gold, Silver, Copper, Tin, Platinum, Lead, Zinc, Iron.

TENACITY.—Iron, Copper, Platinum, Silver, Gold, Zinc, Tin Lead.

DUCTILITY.—Gold, Silver, Platinum, Iron, Copper.

To Preserve Cabbages.

Dig trenches about two feet deep and insert the cabbages upright; then put a layer of straw around them, and cover up, with a tube made of reed stuck down to circulate air among the buried plants. They will keep well all winter.

Rule for Finding the Best Proportion of Power to Tonnage, in Steamboats.

From the square of the velocity of any given vessel, in good weather, subtract the square of the velocity of same vessel in the worst weather; divide the difference by the square of the former velocity, and the quotient, multiplied into double the horse-power of said vessel, will give the power which would propel the same vessel in the same circumstances with the smallest quantity of fuel.

Great complaint is made by the merchants in this city against a common habit of manufacturing establishments in Pennsylvania, New England, and all parts of Europe, to put up dry goods marked with a yard or half a yard more on each piece than there is in actual measurement.

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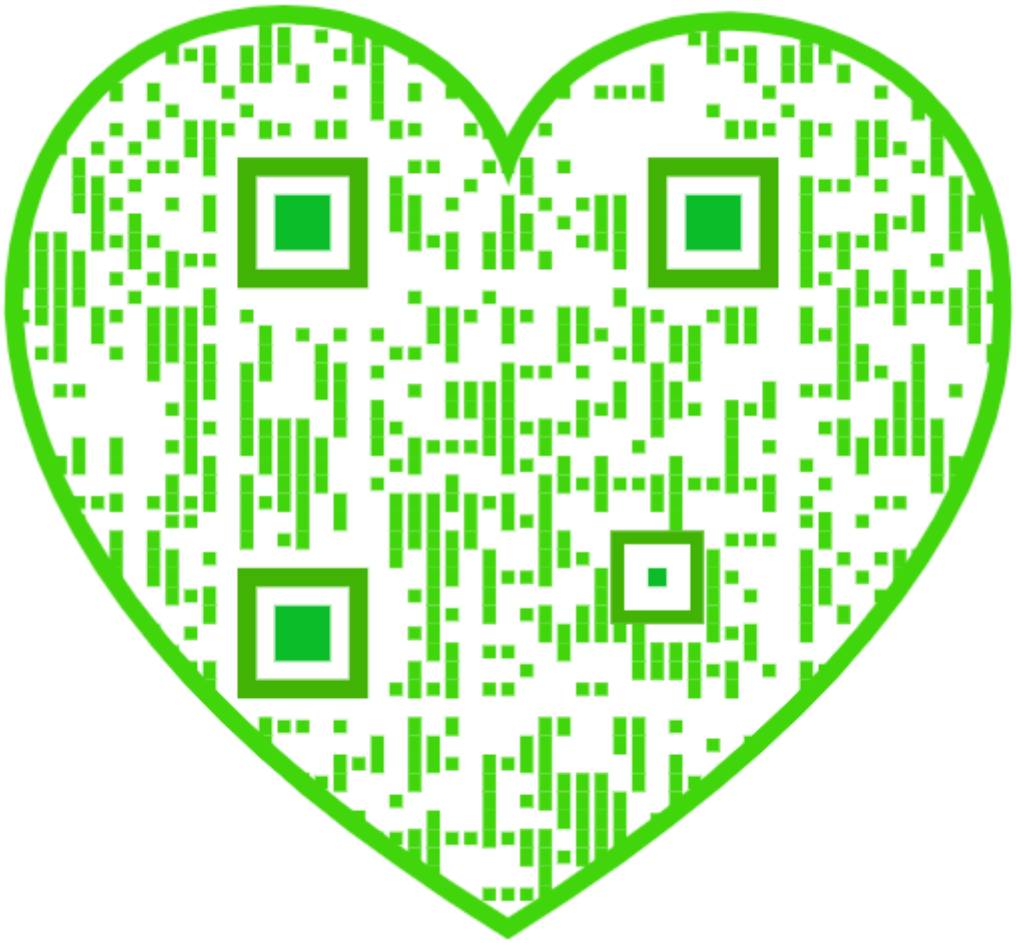

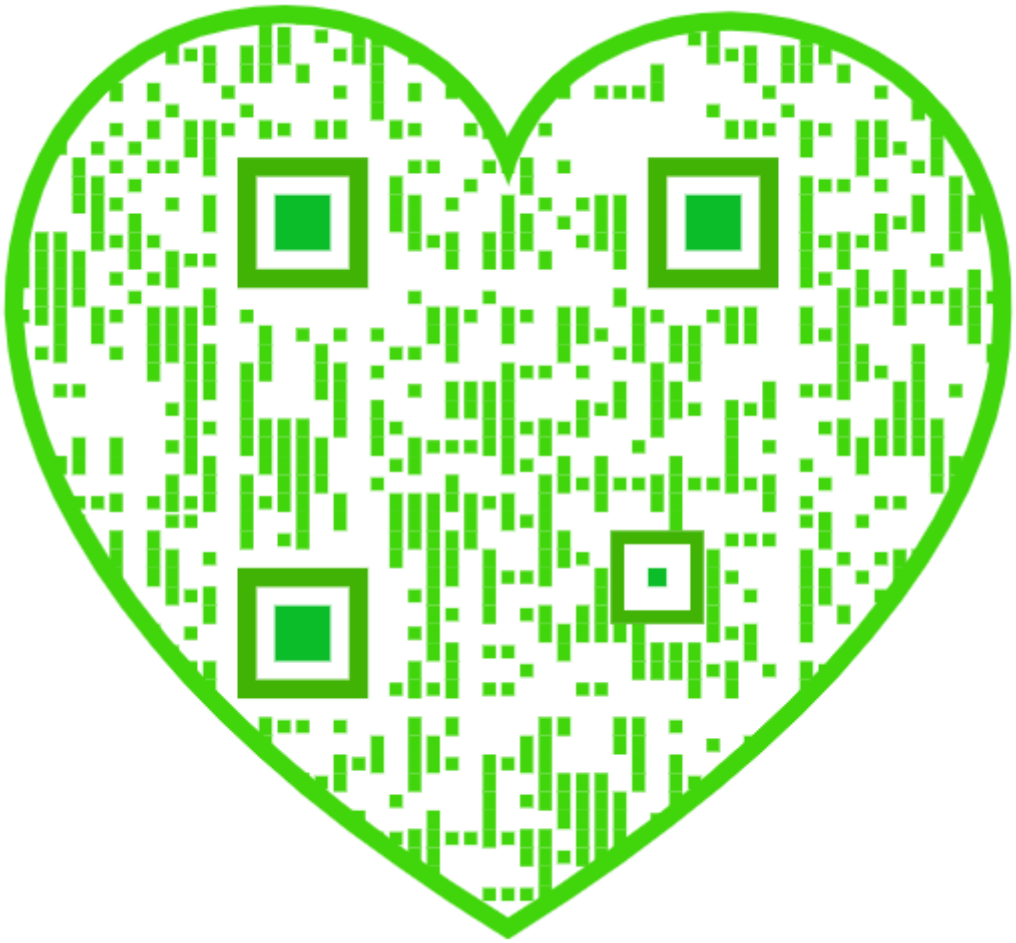

Miscellaneous.

The Planetary System, as it is now Understood.

Sir J. Herschel has lately expressed his opinion, that it is impossible any longer to attempt the explanations of the movements of all the heavenly bodies by simple gravitation, as understoed in the Newtonian theory—these comets, with their trains perversely turned from the sun, deranging sadly our systematic views. Nor are there (writes Humboldt) any constant relations between the distances of the planets from the central body round which they revolve, and their absolute magnitudes, densities, times of rotation, eccentricities, and inclinations of orbit or axis. We find Mars, though more distant from the sun than either the earth or Venus, inferior to them in magnitude; Saturn is less than Jupiter, and yet much larger than Uranus. The zone of the telescopic planets, which are so inconsiderable in point of volume, viewed in the series of distances commencing from the sun, comes next before Jupiter, the greatest in size of all the planetary bodies. Remarkable as is the small density of all the colossal planets which are farthest from the sun, yet neither in this respect can we recognize any regular succession. Uranus appears to be denser than Saturn, and (though the inner group of planets differ but little from each other in this particular) we find both Venus and Mars less dense than the earth, which is situated between them. The time of rotation increases, on the whole, with increasing solar distance, but yet it is greater in Mars than in the earth, and in Saturn than in Jupiter. After other remarks of the same character, he adds, "The planetary system, in its relation of absolute magnitude, relative position of the axis, density, time of rotation, and different degrees of eccentricity of the orbits, has, to our apprehension, nothing more of natural necessity than the relative distribution of land and water on the surface of our globe, the configuration continents, or the elevation of mountain chains. No general law, in these respects, is discoverable either in the regions of space or in the irregularities of the crust of the earth.

[We have endeavored to find out the place where, and when, Sir John expressed himself, as stated in the above extract, taken from an exchange, but have not been able. It is entirely opposed to the opinions of other eminent astronomers, and especially to Dr. Nichols, whose lectures in this country, are printed and cheap, and should be read by every person.

New City of Hadley Falls.

In number 8, we gave an account of the great dam at Hadley Falls, and stated that it was taken from the Springfield Republican.—Since then we have received the Weekly Times Extra from the New City, which gives us new light on the subject, and we make the following corrections.

The credit of planning the New Dam belongs to John Chase, Esq., of Cabbotville, with the assistance of Mr. Anderson, who was engineer for both dams.

The Dam is built of solid timbers, twelve inches square, laid crosswise, one above another, with a pitch up stream, and all bolted and pinned together, sunk to the average depth of four feet into the solid rock in the bed of the river, and there firmly secured. The length of the dam between the abutments is 1017 feet; its width at the base is 90 feet, and its average height, 28. The slope from the top to the upper edge of the base, is on the angle of 21½ degrees. The covering is of plank, six inches thick, bolted-down to the timbers. For fifteen feet upwards from the bottom, it is filled with gravel and stone The upper part and ridge are double planked, and the ridge which is pitched down stream, is covered with thick boiler plate to protect it from the ice. The amount of timber in the dam is about 4,000,000 feet, and the pressure which the dam is required to sustain when there is but two feet of water on the ridge, is upwards of forty-four thousand tons.

The abutments and bulkhead, which together occupy about 200 feet, are constructed of solid masonry. The gate-ways of the bulkhead, thirteen in number, through which the water is let into the main canal, are eight feet wide by fifteen feet high, with double guard gates, securely put in. A gate-house is to be erected on the bulkhead of sufficient dimensions to cover the gates.

Extraordinary Discovery in California.

The following is an extract from a letter written to his wife by a New Yorker, now working in the mines of California. The letter bears date, August 26th, 1849.

There was a gold mine discovered here (what is called Murphy's Diggins) one week to-day, it is evidently the work of ancient times—210 feet deep, situated on the summit of a very high mountain.—It has made a great excitement here, as it was several days before preparations could be made to descend the bottom. There was found in it the bones of a human being, also an altar for worship, and some other evidence of human labor. From present indications it is doubtful whether it will "pay to be worked, as it is mostly all rock, and will require a great outlay for tools and machinery to work it.

This discovery, if properly pursued by competent observers, may prove of the highest historical importance. It will establish the fact that the mineral wealth of that region had been known to proceeding generations, and the relics which have survived, may enlighten us as to the nationality of the people who first pierced this mountain two hundred and ten feet, and will doubtless suggest an inquiry into the reason for abandoning the pursuit of gold in a country in which it seems to abound, and where its discoverers had found encouragement to make such extensive excavations in former times.

Alligator's Nest.

They resemble, says Lyell in his Second Visit to America, haycocks, about four feet high, and five in diameter at their bases, being constructed with grass and herbage. First they deposit one layer of eggs on a floor of mortar, and having covered this with a second stratum of mud and herbage, eight inches thick, lay another set of eggs upon that, and so on to the top, there being commonly from one to two hundred eggs in a nest. With their tails they then beat down round the nest the dense grass and reeds five feet high, to prevent the approach of unseen enemies. The female watches her eggs until they are all hatched by the heat of the sun, and then takes her brood under her care, defending them and providing for their subsistance. Dr. Luzenberger, of New Orleans, told me that he once packed up one of these nests, with the eggs, in a box for the Museum of St. Petersburgh, but was recommended before he closed it to see, that there was no danger of any of the eggs being hatched on the voyage. On opening one, a young alligator walked out, and was soon followed by the rest, about a hundred, which he fed in his house, where they went up and down the stairs, whining and barking like young puppies. They ate voraciously, yet their growth was slow as to confirm him in the opinion, that individuals which have attained the largest size, are of very great age, though whether they live for three centuries, as some pretend, must be decided by future observation.

Clairvoyants.

A clairvoyant in Boston and another in England, have been paying a visit to Sir John Franklin at the North Pole.

They both prophecy that Sir John will yet come home safe and snug. We have our doubts about this: we view Sir John's case on the darkest side, but it is pitiable to see people endeavoring, by humbugging, to make gain out of the misfortunes of others. If there is any virtue in flying machines, here would be a case for an effort.

Steamer Princeton.

This steamer has been demolished at the Charlestown Navy Yard. This is not very creditable to her constructors, for she is not as old by five years, as the Great Western. She was built by contract, under the direction of Com. Stockton, and afterwards purchased by Uncle Sam—good natured soul—to feather somebody's nest.

Decay of Timber.--Prevention of Decay.

Properly seasoned timber, placed in a dry situation with a free circulation of air round it, is very durable, and has been known to last for several hundred years without apparent deterioration. This is not, however, the case when exposed to moisture, which is always more or less prejudicial to its durability.

When timber is constantly under water, the action of the water dissolves a portion of its substance, which is made apparent by its becoming covered with a coat of slime. If it be exposed to alternations of dryness and moisture, as in the case of piles in tidal waters, the dissolved parts being continually removed by evaporation and the action of the water, new surfaces are exposed, and the wood rapidly decays.

Where timber is exposed to heat and moisture, the albumen or gelatinous matter in the sapwood speedily putrefies and decomposes, causing what is called rot. The rot in timber is commonly divided into two kinds, the *wet* and the *dry*, but the chief difference between them is, that where the timber is exposed to the air, the gaseous products are freely evaporated; whilst, in a confined situation, they combine in a new form, viz., the dry-rot fungus, which, deriving its nourishment from the decaying timber often grows to a length of many feet, spreading in every direction, and insinuating its delicate fibres even through the joints of brick walls.

In addition to tho sources of decay above mentioned, timber placed in sea water is very liable to be completely destroyed by the perforations of the worm, unless protected by copper sheathing.

The best method of protecting wood-work from decay when exposed to the weather is to paint it thoroughly, so as to prevent its being affected by moisture. It is, however, most important not to apply paint to any woodwork which has not been thoroughly seasoned; for in this case the evaporation of the sap being prevented, it decomposes, and the wood rapidly decays.

Many plans have been proposed for the prevension of the rot. Kyan's process consists in impregnating the timber with corrosive sublimate, thus converting the albumen into an indecomposable substance. This method, although not always successful, is undoubtedly of great use, particularly where inferior or imperfectly seasoned timber has to be used.. It is, however, said to render the wood brittle.

Payne's process consists in impregnating the wood with metalic oxides, alkalies, or earths, as may be required, and decomposing them in the wood, forming new and insoluble comcompounds. Timber thus prepared will not burn, but only smoulders.

A process invented by a Mr. Bethell, and very good in railway works, is to impregnate the timber with oil of tar: this appears to be very successful in preventing decay, but the danger of accidents from fire is much increased.

Strange Mortality in Black River, La.

The Concordia Intelligencer says that many of the planters on Black River have lost the most, while some of them lost all, of their young calves lately. The mortality cannot be accounted for. The animals are smitten as with a plague, and sink beyond all remedy on the instant. The death of the young calves is not the worst feature of this visitation. The mortality is general along both sides of the river, and the people of Black River will have it that this is the sure precursor of an epidemic visitation upon the portion of the human family dwelling there. We sincerely hope that their fears more than their judgement have associated such an alarming prospect with their present comparatively trifling loss.

Madder.

Some excellent madder has been grown at Flatbush L. I. by a Mr. Gilm, a Dutch gentleman. The sample is good and he states that the soil is well calculated for this plant as that of any country in the world, and that the immense importations of this article, within a few years may, with ordinary industry, be rendered useless, by the production of an article both better and cheaper.

Science Begetting Science.

To the reflective mind human science presents this singular aspect. Whilst the speculative reason of man continually seeks after unity, strives to see the many in the one—as the Platonist would express himself—or, as we should rather say, strives to resolve the multiplicity of phenomena into a few ultimate causes, so as to create for itself a whole, some rounded system which the intellectual vision can embrace; the discoveries of science, by which it hopes and strives to realize this end, do in fact at every stage, increase the apparent complexity of the phenomena. The new agencies, or causes, which are brought to light, if they explain what before was anomalous and obscure become themselves the source of innumerable difficulties and conjectures. Each discovery stirs more questions than it sets at rest. What on its first introduction, promised to explain so many things, is found, on further acquaintance, to have added but one more to the inexplicable facts around us. With each step, also in our inquiry, the physicial agents that are revealed to us become more subtle, more calculated to excite and elude our curiosity. Already half our science is occupied with matter that is invisible. From time to time some grand generalization is proposed—electricity is now the evoked spirit which is to help us through our besetting difficulties—but fast as the theory is formed, some new fact emerges that will not range itself within it; the cautions thinker steps back, and acknowledge that the effort is as yet premature—it always will be premature.

Lectures on California.

The Rev. R. T. Huddart, an eminent divine and philanthropist, will deliver a lecture on California, at the Tabernacle, on the evening of Dec. 4. The object being to raise money for the erection of a church. Mr. H.'s reputation as a lecturer will, we are assured, be a sufficient guaranty that it will be money well expended by those who may wish to attend.—Tickets 50 cts.—for sale at this office.

A Striking Thought.

"The death of an old man's wife," says Lamartine, "is like cutting down an ancient oak that has long shaded the family mansion.—Henceforth the glare of the world, with its cares and vicissitudes, fall upon the old widower's heart, and there is nothing to break their force or shield him from the full weight of misfortune. It is as if his right hand was withered—as if one wing of his eagle was broken, and every movement that he made only brought him to the ground. His eyes are dim and glassy, and when the film of death falls over him, he misses these accustomed tones which might have smoothed his passage to the grave."

Fire and an Afflicting Accident.

On the morning of Wednesday the 2nd inst. a fire took place in Providence, R. I., by which the mansion of Mrs. Anna A. Jenkins was burned down, and herself together with her eldest daughter, Miss Sarah Jenkins, perished in the flames. Mrs. Jenkins possessed great wealth and devoted it to the noblest of purposes, good deeds. She was a member of the Society of Friends, but her charities were confined to no sect. Her daughter was an amiable young lady 22 years of age, and was engaged to be married to a gentleman in New York.

Smithsonian Institute.

The Agents have engaged the services of professor Guyot, late of Neufchatel, in Switzerland, long devoted to the science, and known by his work on Physicial Geography, lately published in this country, to visit the Academies that have been selected throughout the country to register meteorological observations and carry with him the instruments of each—to direct and aid in putting them up, and also to give all necessary instructions as to to the method of observing and of recording the results.

Printed directions are preparing at the Smithsonian Institute, relative to every matter to be attended to.

A committee has been appointed by the Common Council, to report in relation to the laying down of a railway in Broadway.

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The Iron Manufacture.

New York, Nov. 20.

Gentlemen—There having appeared in an American paper a short notice of the patent Blast Furnace of Mr. Yates, at Wingerworth, near Chesterfield, Derbyshire, England, and being the appointed Agent for the introduction of that furnace to the leading iron making district, in South Wales, where I spent twenty-five years in the management of mines and iron works, I trust your readers will bear with some observations on the furnace and the iron trade generally.

My education was (as that of the "princes', of the iron trade) from the age of fourteen, under-ground, and at furnace and forge. My father and grandfather had for nearly half a century, from 1780, iron works on the Wingerworth minerals, at which I was brought up. A plate was presented to my father, as Deputy for Yorkshire and Derbyshire, to Parliament, to protest against the Bill for Taxing Iron, and he was requested to inform the iron masters that, after a second reading, the Bill was abandoned; and which, considering the enormous increase of the trade, (Government at that time, 1806, being the purchaser of two-fifths of the iron made) was perhaps the best escape John Bull ever had from taxation.

I was, at an early age, recommended by the leading iron masters of the above counties to set on collieries, &c., upon an estate containing near one hundred feet thickness of anthracite coal, at the sea side, for Sir Edward Banks, contractor for two-thirds of the Bridges over the Thames, in London, and most of the Government works of his time; and his partner, Mr. Brogden, Chairman of the Committee on Ways and Means, (a friend of Priestley and Franklin)—with whom I was for twenty years connected; and I have, also, in several places, had charge of near one thousand men.

Considering the wreck of capital in the finest field of the iron trade in the world—South Wales—where, as in the States, great part of the primitive capital has been wasted in the midst of hundreds of competent managers of departments, though perhaps not one qualified to manage. I am not surprised at the startling announcement that of sixteen works set on for railway iron, in this country, twelve are at a stand. After disposing of the patent furnace of Mr. Yates, I shall tender observations on this important subject.

Notes taken at Wingerworth, April, 1847:—Nine months ago the green corn was cut on the site of the furnace which has now, for three months, made 120 tons of foundry iron weekly.

The cost of the erection of steam power and blast apparatus, estimated at £1,200. The furnace only 26 feet high, to the spring of the dome, at which point are six doors for charging. The inside diameter at that point is 16 feet, contracting downwards to 6 feet at the tweres. In a stack at the top of the dome, 6 feet high, is a damper, horizontal. The outside diameter, at the base, being only 22 feet, allows only slight brickwork between the three openings, for six tweres, and it had no doubt been better to adopt the iron standards and ring of the Welsh cupola furnace.

The theory of Mr. Yates is taken from the known effect of reflected heat in hollow fires,—the dome being found equivalent to twenty feet height of furnace to the avoidance of *grinding* the material. The furnace is even found to work as well, in all respects, when the materials are allowed to be 10 feet down, and a furnace of only 18 feet in height is contemplated.

Although objections as to wear and tear have induced Mr. Yates to order a blast engine to replace his "Rotary," it may be interesting to your readers to hear that an iron wheel of about 4 feet diameter, the axle and two hollow arms, to admit steam of 100 lbs. per inch pressure, to escape near the rim, by two holes of 3-8 of an inch diameter; the fan on the same axle, is the blast machine for making 120 tons of iron weekly.

I leave it to your calculating readers to say what power of engine of 20 evolutions per minute, is equal to this of 40 lbs. power, having 2000 revolutions per minute. I will conclude this subject with saying, that any queries that may appear in your paper shall be answered to the best of my power.

It is known to persons acquainted with the iron trade, that Mr. Dixon, of Glasgow, many years ago, dispensed with the boshes of his furnaces on the ground that scaffolding at the top of the crucible was the real cause of the irregularity and acknowledged unmanagablity of furnaces, and which Mr. Yates followed up with width of materials and reflected heat upon them, instead of height.

Having been a neighbor of Mr. Crane during the first experiments on anthracite and hot blast, and the erection by him of two furnaces and fire blast engine, to carry out his success, I can state that he could not get the one-third coke off those furnaces until their height was reduced, and great credit was due to Mr. Thomas, of the Crane Stone Works, U. S., for the style in which he set on that work, taking the lead of any thing at that period accomplished in Great Britain.

Mr. Crane having opposed the adoption of the plan of Mr. Dixon, alluded to, in the furnace I erected for anthracite coal at Trimsavan, I divided with him by having the crucible an inverted cone, and a steadier furnace never was erected. I claim the erection of the first good anthracite furnace in Great Britain. As a fact connected with this principle I take the liberty to say that my father having the last charcoal furnace of the midland counties of England, and a contract for navy ballast he could barely fulfil, tried it on coke, and the make was the same as that of Dudley two centuries previously—7 tons weekly—although the same materials as now used by Mr. Yates, —a greater pressure of blast and furnace of the same height proving the vast improvement accruing by width of material and quality of blast.

Having also been a near witness of a great part of the insane management of a dozen of the largest concerns, to the tune of five millions sterling lost to the owners, in South Wales and Monmouthshire, on as good situations as those on which an equal sum has been made, I shall be ready to enter upon the subject, should it be considered desirable; but I shall at present conclude with saying that I undertook the management of the intended iron works in Nova Scotia, chiefly with a view to the amalgamation of the charcoal iron trade, with distillation of wood for products, now supplied to the calico printers of the States from England.

I have apparatus for the trade on a profitable scale, and a knowledge of the uses of the products and the cost and value, would, I believe, lead any party, possessing mines, to give the subject attention. The wood of America is proved to be superior for this purpose.

I shall, with your favor, shortly moot a subject of vital importance to the American public—that of pig iron being generally made at about $15 per ton, or as cheaply as in Great Britain, yet with the average quality of bar iron; that for horse shoes at near $80 per ton. The works in this country stopped and stopping, in the face of the fact that their machinery equals that of Great Britain, where similar iron is barely half the above price. By way of stimulating the proprietors of this country, I have to say, I remember £20 per ton being paid for the conversion of pig into bar, by pudling, and no fortunes making; and I have seen fortunes rapidly made when there was barely one-fifth that sum, for the conversion; and none of the established works stopped when there was no certain difference in the value of best forge pig and bar iron—a state of things worse than those in this country by about £10 per ton of iron. T.B.

Multiply the pound sterling by $4,84, and the amount in dollars will be ascertained.

Annihilation of Time and Space.

The steamship America's news was transmitted by lightning from Halifax on the 16th, along the line to New Orleans, stopping at the intermediate cities to write down its message and the announcement of its reception at New Orleans came back to Halifax within 48 hours, during which time it had travelled a distance of five thousand miles! Rather an improvement on the old post-boy system.

For the Scientific American.

Important Discovery that may Lead to Improvements of Great Value.

(Concluded from page 76.)

If we ask the first dozen men we meet what power it is that carries a ball towards the sky when thrown upwards from a gun; the majority if not all will tell us it is the force of the powder. If we reply that as the ball is continually resisted there must be some force continually acting upon it, and that cannot be the powder, because there is no connection between it and the powder after it leaves the gun; we may then be told that it is the motion which the powder gave it that carries it up. That it is, however, some power foreign to motion, is shown by the fact that it resists a change to motion to the same extent exactly that it resists a change from motion. But waiving all that, how do we know that what we call motion in a body is not a greater or nearer approach to a state of rest than the body was in before. For instance, if we fire a ball parallel with the earth's path towards the west, instead of increasing the ball's motion, we will have lessened it, because the ball was travelling with the earth eastwardly before it was fired, and was only travelling less fast in the same direction afterwards. But for aught we know, the whole solar system, or all the visible universe, may be rushing in some unknown direction, so that to say it is motion that carries the ball upward, is simply to declare one's ignorance of the whole matter. It seems to be a principle that belongs to all substances with which we are acquainted, and perhaps we can find no better name for it than inertia. At least we can use that term till we find a better.

Having said thus much on the law itself, let us now see if we cannot apply it to practical purposes of no ordinary value. Let us see if we cannot solve the following problem:—The length, breadth, and depth being given, what is the best possible form for running it easily through the water? If we were entirely unacquainted with the matter, the first inquiry would be, what is it that resists a vessel? What principle is it that prevents it from going rapidly? Many, or most people, suppose it is friction.—(See an article in the Scientific American in which it is proposed to lessen the friction by a surface of air between the vessel and the water.) It cannot, however, be friction, for water is one of the smoothest things possible. It must have even less friction than ice, and we all know how easily skates will run, notwithstanding their edges cut the ice, which must waste some power. It is not necessary, however, to examine the question of friction at all, because we know of a resistance which a vessel must meet with, sufficient to account for more than 95 per cent of all the resistance she does meet. That resistance is the power of inertia. That a vessel must overcome the inertia of the water is self-evident the moment we reflect upon it. Therefore, in building we should have reference to the laws of inertia, and so shape the vessel as to have to overcome as little inertia as possible. In order that we may reason upon it where we shall be beyond other influences, let us suppose a vessel sailing or passing endways through space, where the attraction of planets could not disturb it, and let us further suppose that there are floating here and there in those lonely regions, balls of metalic or other matter, of such size as on the earth would weigh a pound. Let the vessel be 640 feet long and 64 feet wide, and let the centre of its path lie one inch to the left of one of those balls. What we want is to apply a force to the ball that will move it from the path of the vessel so as to clear the vessel's greatest breadth, and bring it back to its original position, with the least expense of power. If the vessel is sailing at the rate of 160 feet a second, and we apply a spring ballance to the ball, and pull it towards the right, with a force equal to half a pound; in one second the ball will have moved eight feet. That would indeed be enough to clear the vessel, because the next second the ball would move 24 feet; but as it would then be going at the rate of 32 feet a second it would not be possible to arrest its motion and move it back in two seconds more, without an unnecessary expense of power. Therfore let us try the experiment over and apply to the spring ballance a force equal to a pound. Such a force would move the ball 16 feet the first second. The ball's motion would then be 32 feet a second, so that if we let it alone, by the time the vessel's beam or centre of length passed it, the ball would be sixteen feet to the right of the extreme breadth of the vessel but as part of our object is to bring the ball back to its original position, therefore at the end of the first second we reverse the position of the spring balance and draw the ball to the left with the same force of one pound, and at the end of two seconds it will just pass the greatest breadth of the vessel, and its motion to the right be arrested.

Continuing to draw to the left to the end of the third second, the ball will then be within 16 feet of its original position, and moving at the rate of 32 feet a second. We therefore again change the spring balance to the right, and at the end of the fourth second, the ball's motion will again be arrested; and that, too, so as to leave it in the identical spot from which it first was moved. A less force than one pound on the ball would not have answered, and a greater would have been useless. It is now evident that the path of that ball from the bow to the stern shows the true shape for the vessel; for if the ball had not been moved by external force, the vessel would have had to move it; and if the vessel had been shaped as ships usually are, the motion given to the ball would have been much greater; and therefore the inertia overcome greater, also to do which must of course require proportionally greater power.

But why, it may be asked, should we be at the expense of bringing the balls back? Why not let them go? That would indeed be best if we were actually sailing through space, as supposed; and in that case the stern should have the greatest breadth; but as water subject to gravity is pressed upon by surrounding water, we must permit it to come back at the same even rate of motion, or lose power by a tendency to vacuum. In the supposed case there is a vacuum fore and aft, so that a vacuum there makes no difference; but where water is subject to gravity, we must avoid a tendency to vacuum, or we will have pressure as well as inertia to contend with.

We have now arrived at that point in the progress of our enquiry, where the question arises, what is the form of the path described by that ball? Reason tells us what it should be. And the path of our globe, in its annual revolution round the sun tells us what it is. Our globe is acted upon by a steady force, and it obeys that force in the same manner exactly as that ball would obey the spring balance.

From the explanation we have now made any one acquainted with philosophy and figures can estimate the path of that ball, and the proper form for a vessel, where the length, breadth and depth are given; but to save trouble, we give the following rule:—Divide the breadth of beam at the centre of the length into 256 parts; and the following figures will give the exact breadth in those parts, at each sixteenth of the distance to the bow and stern —254, 248, 238, 224, 206, 184, 158, 128, 98, 72, 50, 32, 18, 9, 2, 0.

If the builder choose perpendicular sides for the vessel, one division will be sufficient; but if he prefer a rounding bottom, he may take the breadth at the centre of length, at as many points as he pleases, from the keel upwards, and use the same division each time; that is, divide the breadth, at each measurement, into 256 parts, and keeping on a horizontal line to the bow and stern, use the figures as before.

Wonderful Rock in Lake Superior.

A very remarkable rock, it is stated by the Detroit Free Press, (but of which we have doubts) has been discovered in the middle of Lake Superior. It rises only about four feet above the surface and extends down to an interminable depth. The discoverers relate that the rock appears to be a place of general resort for the salmon trout of those lakes, as they found them in almost incalculable numbers, having, during their short stay, caught several barrels with no other instrument than a rod of iron, on one end of which they turned a hook.

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New Inventions.

Locke's Electro Chronograph.

This apparatus, for which an apropriation was made by Congress last winter, has been put in operation at the National Observatory Washington.

The clock case is of fine Italian marble, ornamented with glass panels, set in silver sashes. The dial and hands are like those of an ordinary clock, but the dial is cut out and made a skeleton, for the purpose of giving access to the electrical works behind it. The pendulum is made throughout of glass; to compensate for the expansion even of glass by heat, the weight of the pendulum consists of four large glass tubes, placed side by side, like organ pipes, and filled four or five inches deep with quicksilver. The suspension of the pendulum consists of hardened steel cylinders, rolling on jewelled planes made of polished chrysolite. The mechanism by which the electrical contact surfaces are kept clean and bright is very ingenious and was suggested to Dr. Locke by Prof. House of New York. It consists of a small platinum cylinder which is kept revolving with a wiper to keep it clean. This cylinder has also a longitudinal motion, which, by reciprocation makes the electrical contacts, which occur every second, travel in a spiral, which also revolves. The result is, that the contacts are made every second for 36 days without occuring twice in the same place; and even then it is a mere chance if the contacts are recommenced in the same tr ack.

Every time a contact is made a slight mark is left, by electrical action, on the platinum surface; and when the spiral revolution has been completed, the cylinder is marked all overits surface by geometric intersections.

The clock contains a duplicate interrupter or electrotome, which may be brought into action when desired. It consists of a little tilt-hammer, pivoted concentrically with the pendulum, and lifted by a little arm, or its equivalent, projecting from the pendulum itself.

We have noticed no less ~~than four patents~~ recently taken out in England for improvements in Clocks moved by Electricity. The first Electric Clock known was invented in 1815, by a German named Buzengeiger. This was a local clock. The first Electric Clock to move in unison any number however distant, was invented by Bain in 1840. Since then there have been a great number of modifications such as combining a register with the clock, which is a most important improvement.

Remington Bridge.

Mr. Remington who has made such a noise in the world has arrived at New Orleans and has erected a model of his bridge. It extends across a space of ninety-six feet, and is elevated some ten feet from the floor. Its appearance is so fragile, that few men, judging from this alone, would willingly trust themselves upon it, yet plenty walk over it and stand on it. It has four longitudinal supporters, each less than one inch square at the centre, butincreasing gradually in size, until at the ends or points fastening, they are 2½ inches square. The bridge has one catenary and two parabolic curves, by which strength and beauty are both secured. The flooring is attached diagonally, and is made to sustain a portion of the strain. The deflexion of the supporters is 22½ inches. It is capable of bearing the pressure of 7 tons; while each of the supporters, occupying their place in the bridge, will sustain a weight greater than the absolute strength of the timber and the direct cohesion of its fibres.

Forceps for Gun Shots.

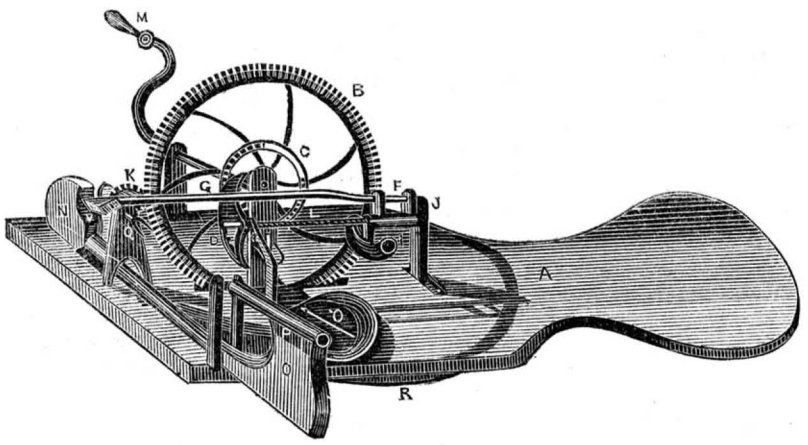
Dr. A. D. Chaloner, of Philadelphia, has invented a new instrument for extracting balls from wounds, which consists of a pair of slender steel forceps, six inches in length, and terminating in a cup shaped cavity, whose edges are toothed. The instrument, when closed is a probe, and then passed into a wound, the object found, the blades are then opened, and the shot is caught and extracted. Thus but one instrument is used and much pain avoided.

Biscuit Cutting Machinery.

Mr. Editor—I noticed in the "Farmer and Mechanic," of last week, a communication from a correspondent, Mr. A. Longbottom, giving a description of the machinery used for making biscuits by the British Government, at Portsmouth, England. The establishment is very perfect, and I cannot but commend it to the attention of our Government. The British baking establishment takes the wheat, and in a few hours brings it out baked into biscuit for the Navy, and packed into barrels. In this country the Government would rather lose than gain by assuming the office of Miller, but to have always good fresh bread, it would gain to assume the office of Baker. But my object in this communication was to notice the superior machinery, which the biscuit manufacturers use in this city, for cutting the biscuit, in comparison with that described by Mr. Longbottom, and for which, as he states, the British Government paid a Mr. Grant $10,000. At Portsmouth the cutting machinery of Grant does not, (as described) feed in the sheet of dough to the cutters, nor carry it away. The Biscuit Cutting Machines, in this city, invented by Mr. Nevins, both rolls the dough into a correct sheet, feeds it into the cutters and carries the cut biscuit away. The simplicity and perfection of this American machine, is at once apparent to any person who will take the trouble to visit the Baking Establishment of Messrs. Wilson & Co., Fulton street. The inventor secured a patent in 1836, but he has been subjected to the fate of many of his class, to piracy. This machine was exhibited in England by the inventor three or four years ago, and was greatly admired by Lord John Hay, whose mechanical abilities and scientific accomplishments are of a very superior character. The British Government had too much money invested in the old machinery to adopt any thing new, as the destruction of the old would be the necessary result. And let me state here that this is the reason why many new and valuable machines take a long time to find their way into general favor. Yours, New York.

NEW APPLE PARING, CORING AND SLICING MACHINE.

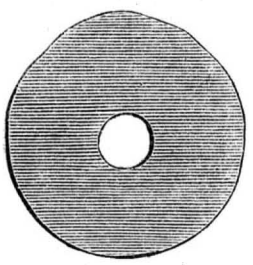
Figure 1.



This machine is the invention of Juliu Weed of Painsville, Ohio, and patented by him on the 31st of ~~last July~~. It combines the pairing, coring, and slicing processes, in one operation. When the apple is pared it is placed into a receiver, and it comes out cut into regular slices, like fig. 2. They are just the thing for stringing up, and those who dry apples will at once see the beauty of the operation.

Fig. 1 is a perspective view, and fig. 2 is a view of a slice of the apple, as it comes from the machine. A is a neat frame, B is a wheel with teeth on its periphery; C is a small wheel on the same shaft cast with the large one. Its teeth are only on two sections of it, as represented; G is a small section wheel on the end of the shaft, L, placed in a bearing, J. The sector, D, gears into the teeth of C, and it is

Fig. 2.



carried partly round, pressing on the wooden handle, F, of the knife, V, which is placed horizontally; I is a suspended balance weight on the shaft, L. Q is a fork, on which to place the apple. K is a pinion to revolve the fork by the wheel, B, which is driven by the crank handle, M. The edge of the knife, V, is not easily seen, but it is fixed on a small head, with an opening in it through which the parings are forced out. The apple is placed on the fork, Q, against the edge of the knife, and the fork then gets a rotary motion, and the knife is carried forward and over, from one end of the apple to the other, by the sector, D, being carried round by the teeth on the section of wheel C; and when this is done the balance weight, I, brings back the sector, D, and the shaft, L, rotates back, bringing the knife to its former place, the bearings of which, at F, being secured on the thick end of the shaft, L. When the apple is pared (the fork still revolving) the tin tube, P, on its slide, O, is drawn forward by the handle, N, against the apple, and goes through it, coring it with an opening like that in fig. 2. The apple is then placed into a recess, O 1, under which there revolves a horizontal table with a series of steps around it, which have sharp edges. These carry the apple against the side of the recess, and each step, therefore, cuts off a slice like fig. 2, then carries it along and discharges it below; fit for the string or any other purpose for which it is intended to be used. Fruit dried by stringing will always find a readier sale than by any other way. This machine is named Weed's Patent Buckeye Paring Machine. It comes recommended by some of the most respectable men in the State of Ohio, and there is no other machine of the same kind that combines the properties of paring, coring, and slicing at one operation. The teeth on the periphery of the wheel, both drives the fork, and, passing down into an opening in the table, A, drives the rotating slicer also.

Portable Soup Bread.

Mr. G. Borden, Jr., of Galveston, Texas, has invented a new kind of bread, which is a combination of concentrated meat and biscuit. It is made into small cakes and put up into small tin cases, one of which will be food enough for a stout man for a week. It is exceedingly convenient for travellers, or persons at sea, as it will keep for a great length of time. One ounce of it, by crushing and mixing it with three pints of water, if boiled for a few minutes, makes a most excellent soup, enough to make a very decent meal for one person. We have tried some of it, and by seasoning it properly we found it to be both palatable and nourishing, good meat and drink, for any person. He has taken measures to secure it by patent.

Force Pump.

We would call the attention of our readers to the advertisement of J. A. Brush, in another column: one of these pumps was in operation at the Fair, and attracted much attention. We have witnessed its operation, and give it our approval. Its construction is simple, and it is not liable to get out of order like many others.

New Optical Instrument.

Prof. John Locke has invented a curious instrument, named by him Phantascope, which will illustrate, in a manner never before accomplished, "single vision by each eye." It is very simple, and has neither lenses, prisms, nor reflectors. It consists of a flat board base, about nine by eleven inches, with two upright rods, one at each end, a horizontal strip connecting the upper ends of the uprights, and a screen or diaphragm, nearly as large as the base, interposed between the top strip and the tabular base, this screen being adjustable to any intermediate height. The top strip has a slit one-fourth of an inch wide, and about three inches long from left to right. The observer places his eyes over this slit, looking downward. The moveable screen has also a slit of the same length, but about an inch wide. If there are two identical pictures of a flower, about one inch in diameter, placed the one to the left and the other to the right of the centre of the tabular base, or board forming the support, and about two and a half or three inches apart from centre to centre. A flower-pot or vase is painted on the upper screen, at the centre of it as regards right and left, and with its top even with the lower edge of the open slit. By looking downward through the upper slit, and directing both eyes steadily to a mark, a quasi stem, in the flower pot or vase—instantly a flower similar to one of those on the lower screen, but of half the size. will appear growing out of the vase, and in the open slit of the moveable screen. On directing the attention through the upper screen to the base, this phantom flower disappears, and only the two pictures on each side of the place of the phantom remain. The phantom itself sonsists of the two images painted on the base, optically super-imposed on each other. If one of these images be red and the other blue, the phantom will be purple. If two identical figures of persons be placed at the proper positions on the lower screen, and the upper screen be gradually slid up from its lowest point, the eye being directed to the index, each image will at first be doubled, and will gradually recede, there being of course four in view until the two contiguous coincide, when three only are seen. This is the proper point where the middle or double image is the phantom seen in the air. If the screen be raised higher, then the middle images pass by each other, and again four are seen receding more and more as the screen is raised.

As all this is the effect of crossing the axes of the eyes, it follows that a person with only one perfect eye cannot make the experiments. They depend on *binocular vision.*

All these effects depend on the principle that one of the two primitive pictures is seen by one eye, and the other by the other eye, and that the axes are so converged by looking at the index or mark on the upper screen that those separate images fall on the points in the eye, which produce single vision. To a person who has perfect voluntary control over the axes of his eyes, the upper screen and index are unnecessary. Such an observer can at any time look two contiguous persons into one, or super-impose the image of one upon the image of the other.

Improvement in Sugar Manufacture.

The N. O. Prices Current states that after much study and experiment, Colonel Dakie has reduced to practical expediency and utility a discovery of his own, by which he is enabled to convert the bagasse from the cane-mill into excellent fuel the moment it is discharged from the rollers. This is a desideratum long wished for by the sugar planter, and one which has ever heretofore puzzled and defied the mind of inventive genius to achieve. It is destined to prove one of the most useful discoveries of the age.

New Marine Beds.

Mr. Wm. P. Baker. of Boston, has invented and patented, what he calls a self-adjusting set of Berths, and a Cabin Table, which are kept constantly on a level when the vessel is rolling at sea. It is an ingenious contrivance to do away with sea-sickness, and will be hailed with admiration by ladies who have a dread of the sea.

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Scientific American

NEW YORK, DECEMBER 1, 1849.

Science Universal.

Science belongs to no country, and owns the sway of no regal sceptre. In the days of old we find her dwelling by the banks of the famous Nile, and anon we find her casting her shadow upon the land of Pharaoh, and taking up her brilliant abode in the Isles of Greece. Passing from the land of Pythagoras, we behold her led captive by the iron band of the Roman, soon to be changed into silken cords, in honor to that genius, which soon crowned Rome with splendid specimens of Grecian Art, and made her Academies resound with Attic eloquence and philosophy. When barbarian darkness overspread Europe like a flood—we find Science calmly seated by the Dardanelles, and also teaching in the Schools of Alexandria, once more trimming her lamp by the sacred waters of the Delta. It was a dark day for Science when the Turcoman gave her wonderful Library to the flames, and by one fell bigotted edict, swept from the face of the earth those volumes which would have displayed to us vast treasures of ancient mind, and given to us invaluable stores of ancient knowledge. We are well aware of the insane exhibitions of religious zeal displayed by almost every sect, against some kinds of books; and while we mourn for human weakness in such acts, we cannot but denounce them in the same breath, and rejoice that better days have dawned upon the world universal.

It was a happy event for Europe when the Crescent subverted the Cross on the Minarets of St. Sophia. It was then that the Grecian philosophers became again the pilgrims of science, and carried both their learning and arts into every kingdom of Europe. In Italy many fountains of knowledge were opened, and the dark clouds of Gothic barbarism began to roll up "like leaves of the forest when scorched by the fire." And soon from the far North, even from Denmark's snowy coast, the light of Copernicus arose like a star, to revolve like the beautiful system which he discovered.

Since that time science holds a universal court. She sits in the Isles of the Sea, and has had her court made up of king-men, like Bacon and Newton, and Watt and Davy, and a host of others. In Germany she has had, and still has, her great king-men also. The land of the Gaul has had her host of king-men, too, and many yet she has. And what shall we say of other lands? A new World—our own land—has her King-men and Courts of Science, and the future is bright with the most brilliant hopes. Rittenhouse and Franklin are with the dead, but though dead they yet speak, and many have arisen, and many will yet arise, in our country, like them, to place richer gifts of genius in the Treasure-house of Science.

The Emperor, Charles the Fifth, paid a beautiful compliment to science, when he stooped to serve an aged painter; and to the credit of modern kings and conquerors, be it spoken, that although they engaged in conflicts "fierce and vengeful," yet they have paid those respects to science, in her votaries, which ancient heroes paid to the priests of Delphos. A powerful foeman will bend in respect to the frail bark of his nation's enemy, when afar upon the lonely sea, if it is in search of unknown lands or rivers—on a voyage of discovery; and thus it may be said, "science reigns universal on land and sea;" and it would be well for mankind if many aspirants after worldly fame, sought to win their laurels in the field of science, rather than on the field of battle. Science seeks no pleasure in, and points to no trophies of cities laid in ashes, and garments rolled in blood. No, she sits enthroned in the temple of peace, silently watching the planets in their courses, and listening to the music of the rolling spheres,—and the time will yet come when along with pure religion, it will govern and direct the actions of all men.

An article on the "Practice of the British Courts," in relation to Patents, is necesssrily left out till next week.

Interesting Patent Cases.

THE CASE OF WILSON VS. BARNUM.—PLANING MACHINES.

In our last number, we noticed that the injunction in this case was dissolved, upon certain conditions. Since that time we have learned that after the argument of both parties was closed, it was agreed that a final hearing should be considered as having taken place, and that the cause should be speeded to a hearing before the Supreme Court, on a certificate of the Judges on the following question.

Whether, according to the true construction of the Woodworth Patent, as amended, the machines made or used by the defendant at the time of filing the bill, or either of them singly, do or do not infringe the said amended letters patent?

Upon this being done, the Court made an order that the injunction should be dissolved, on defendant filing a bond in Court to the plaintiff, in ten days time, in the sum of $10,000, with security, to account for and pay over to plaintiff all profits which should arise from the use of defendant's machines, in the event of a final decree for plaintiff, and that in the case this was not done, then that the plaintiff should, in ten days thereafter, file a bond to defendant, in $10,000, with security, for the payment of all losses or damage defendant might sustain by reason of the continuance of the injunction; and that in such case, the injunction should stand until the final decree or further order, and if this were not done that the injunction should be dissolved without condition.

Counsel for Complainant—S. V. Smith, St. Geo. T. Campbell, Philadelphia; J. H. C. Latrobe, Baltimore; Governor Seward, New York.

Counsel for Defendant—Wm. W. Hubbell, Wm. L. Hirst, Philadelphia; E. W. Stoughton, New York.

Our readers will see how important this case was when such eminent counsel were retained. The defendant had filed his bonds.

RE-ACTION WATER-WHEELS.

On the 20th inst., before Judge Kane, Philadelphia, the case of Parker vs. Hulme for infringement of a patent for water wheels, was decided in favor of the plaintiffs—$75 being the damages awarded.

The following questions were submitted to the jury, and found in the affirmative:

Were Zebulon Parker and Austin Parker the first persons to discover, and by mechanical devices to apply to use, as a motive power in re-action wheels, the centrifugal force of water revolving vertically round the shaft, and passing into and acting on the wheels in the direction of their revolution?—Yes.

2. Were they the first persons to invent and apply to use vertical re-action wheels, having two or more wheels arranged in pairs on the same horizontal shaft?—Yes.

PATENT SAFE.

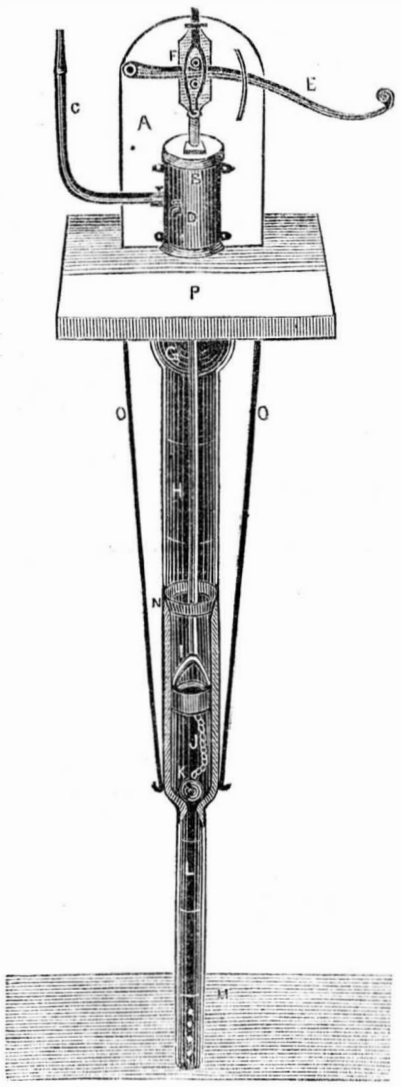
Benjamin G. Wilder vs. Silas G. Herring.—To recover $20,000 alleged to be due to Mr. W. by Mr. H., on an agreement given to Mr. H. the exclusive right to manufactnre and sell Wilder's Salamander Safe in the city of New York, paying to Mr. W. for said privileges one cent per pound on all safes so made and sold. There was a clause in the agreement, by which it was provided that if Mr. Wilder did not establish his right to the patent within three years from the date of the agreement, the 1 cent per pound was not to be paid. Mr. W. within the time obtained a verdict in his favor in this Court, against a party charged with infringing, by which his right to the patent was established. Mr. Herring contends the agreement to have meant that the patent should have been established in the Supreme Court of the United States, while Mr. W. insisted that a verdict in his favor in a Court having competent jurisdiction, establishing his patent, was within the meaning of the agreement. The Court in its charge, held to the latter principle. Verdict for plaintiff in amount. For plaintiff Messrs Staples. For defendant, Mr. O,Conner and Messrs, Maxtin, Strong and Smith.

Sixty tons of good anthracite coal have al ready been got out from the mine lately discov ered by Prof. Ridgeway at Cranston, R. I.

Improved Atmospheric Lifting Pump.

This pump was invented by Dr. John B. Read, of Tuscaloosa, Ala., and patented on the 11th of last September.

This engraving is a vertical section, showing all the principal parts. A is the top box of the pump; B, is the cylinder, which is a large tube made of joints screwed together and extending downwards below the platform, P. C is the discharge tube; L the suction do., and M the water in the well, &c. E is the handle; D is a stop cock; F are two rollers, in which the pump handle plays in the upper shoulder of the piston rod, and it moves between guide bars to make the piston travel perpendicularly; G is a globular air vessel; H is the pump chamber, with the piston rod represented passing through it. I is the piston, with the upper valve, M, attached, and K is a lower valve, connected to the piston by the chain, J. The aperture at the lower valve is easily distinguished. There is a cap upon the top of the cylinder, which can be easily taken off, and the piston taken out at any time. O O are small iron rods, which with a third posterior to the pump, and not shown,



are used for supports. They are made fast below by hooks to the outside of the pump chamber.

Water is to be raised from M to I by atmospheric pressure (about 28 feet) and then it is lifted through the space above that, whatever it may be. The bottom of the pump chamber, as represented, is spherical, and from the aperture at the ball valve, the chamber gradually widens to some distance upwards, and the chamber has a flare or trumpet shape form at the valve, N. The chain is therefore made of such a length that when the piston, I, is drawn up into the trumpet shaped part at N, the ball valve, K, will be off the aperture, and the water in the chamber above the piston will pass down into the well.

The pump can be made either of wood or iron, or a combination of all these materials, to suit places, where such materials would be most economical. The claim is for the combination of the lower valve with the piston, and the chamber formed of a bell shape, to let the water pass down into the well, as described, to prevent it from freezing; also to take up the lower valve along with the piston, when required. This is a valuable improvement on the atmospheric lifting pump.

We would state here that the professional duties of the Doctor prevents him from giving any attention to the introduction and sale of his invention, and he is desirous to sell or make some agreement with persons who may desire to make a good investment. Letters (*p. p.*) to him will meet with prompt attention.

Paine's Electric Light.

"A man's useful inventions subject him to *insult*, robbery, and *abuse*."—FRANKLIN.

GENTLEMEN:—The above forcible remark of the "Lightning Bottler" must have been called forth by some such an attack as your correspondent, "A Gior," has seen fit to make on your humble servant. If "A Gior" has, as he says, read my communication with interest, he is aware that the tenor of my statements is *not prospective*—that I speak of what *has* been done publicly, and of what is continually doing, and yet "Gior" pleases to express his doubts because, forsooth, the results conflict with "well known indisputable facts in chemical science." There was a time, I believe, when people spoke of the *four* elements as indisputable facts—the incompressibility of water was once an indisputable fact, and the universal, indisputable fact of the fixidity of the earth was once demonstrated, and satisfactorily to *his* well known principles, by a philosopher in the South Seas, by placing his calabash in such a position that, if the earth did roll over it would be capsized. I believe that the result is too well known to repeat it here.

When "Gior" cites a single instance where a valuable invention has been protected by a patent law, from piratical infringements or ruinous law suits, I will notice his remarks on the subject.

I heartily agree with "Gior" in his remarks on the subject of review; but how can he review a subject of which he is totally ignorant,—is he aware that water is a simple substance—and oxygen water *held in solution* by positive Electricity, and hydrogen by its negative? Is he aware that within a year past the electric fluid has been collected and *weighed?* If he is aware of these facts, his remarks are insulting and abusive; and if he is not, he has no *indisputable facts* to predicate his review upon. In short, it seems to me that *Carbureted Hydrogen* would have been a more proper signature to his article, as it would at least have expressed the motive that induced him to pen his article—that of interest in the present mode of gas lighting. Yours,

HENRY M. PAINE.

Worcester, Nov. 14, 1849.

An Effort to Increase the Usefulness of the Mechanics' Institute.

At the last business meeting of this Institute, a resolution with this object in view was adopted, and a Cemmittee of ten appointed, with power to increase their number, to take into consideration the best means to erect a suitable building, in a proper location, and thereby extend its privileges to the operative mechanics of our City, to whom we owe so much, and for whose especial benefit the Institution was originally organized. We really hope that this effort will be sustained, not only by men of wealth who have realized fortunes from the genius and industry of our mechanics, but by the mechanics themselves who, in the present flourishing state of mechanic arts in our City, are fully able to sustain their own institution and make it an ornament to our City and country, and a model for the manufacturing cities of the world.

New Ship Ventilator.

Mr. Emerson has been exhibiting in Boston an improvement in ship ventilators, by which persons between decks can at all times enjoy the luxury of pure air. These ventilators are of two kinds—one of them being an injector and the other an ejector of air. Each is fixed upon a tube, about thirty-six inches in circumference, which rises about four feet above the deck, and this tube is contrived so as to prevent rain or the ocean spray from entering the vessel.

Lecture on Patent Laws.

We are much obliged to Geo. Gifford, Esq., for a copy of his Address on the Patent Laws. We will notice its contents next week.

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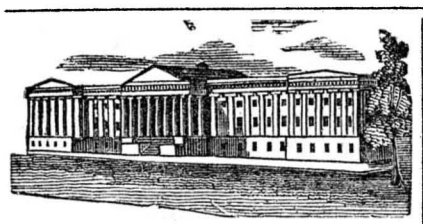

LIST OF PATENTS CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending November 20, 1849.

To John Sheldon, of Milleville, N. Y., for improvement in Chronometers for longitude.

What I claim is the Dial with four hands, which are at right angles to each other, and revolve once in 24 hours; said dial being divided into hours and degrees, substantially in the manner and for the purposes above described.

To John Chase, of Craftsburg, Vt., for improvement in Ox Yokes.

As I do not desire, nor intend to interfere with the claims of Mr. David Chappell, as set forth in a patent for a Yoke, heretofore granted to him; but what I do claim is the pinion and rack bars, working within the beam in the manner and for the purpose set forth.

Second, I also claim the two iron plates as set forth. I also claim the grooves and tongue, in the manner and for the purpose set forth.

To Luther Cole, of Lafayette, N. Y., for improvement in Scythe Snaths.

What I claim is curving forward that portion of the snath between the right hand nib, or thole, and the extremity to which the scythe is attached, in such manner as to form an obtuse angle between the scythe and snath, at the point where they are joined, by which device the left hand and arm are extended forward (previous to the scythe's entering the grass) so that the labor of cutting is performed as much by drawing in the left arm, as by forcing around the right, at the same time the position given the scythe, allows it to cut the whole length, and is more easily sharpened at the heel with the rub stone, than scythes hung on ordinary snaths.

To Ashley Crafts and Ebenezer Weeks, of Auburn, Ohio, for improved Auger for boring earth.

We do no not claim to be the original inventors of an auger for boring in the earth, but what we do claim is the peculiar construction of the auger, as aforesaid, viz., the combination of the spiral lip or shelf, extending the whole length, or nearly the whole length, of the spiral twist, with the said spiral twist, which is made to approach the centre gradually, till it intersects the shaft or stem, forming an auger of a shape approximating to that of a frustum of a cone, and being entirely open at the lower end.

To Carl Falkman, of Stockholm, Sweden, for improvement in Distilling and Rectifying Spirits. Patented in Sweden, Aug. 5, 1848.

I do not wish to confine myself to the special construction of the apparatus herein described, as this may be variously modified, without changing the principle of my invention; but what I claim is the method of purifying and rectifying spirits, or giving any described scent or flavor thereto, by causing the vapor of spirits to pass through a partial cooler containing the required substances for purifying, rectifying and impregnating it, substantially as described, whereby the vapor of spirits in passing through the said apparatus, under the combined action of partial cooling, is concentrated and purified, and separated from water and the substances employed for imparting odors or flavors, as described, and this I claim, irrespective of the kind of substance or substances, separately or connectedly, which may be used for producing the chemical effects on the spirit vapor.

To John W. Frost, of Croton, N. Y., for improvement in Machines for Moulding Brick.

What I claim is the combination of the slotted bar with the levers and the pin or bolt, and cranks, secured to the horizontal transverse shafts and connecting rods, attached to a presser, cogged section, and rack, on the carriage, for causing the presser to be raised in the moulding box, simultaneously with the movements of the filled moulds, from under the moulding box, substantially as herein set forth.

To Elijah Jordon, of West Cummington, Mass., for improvement in Ink Fountains.

What I claim is the mode of supplying the pen or marking instrument with ink, by the pen or marking instrument acting upon the valve or stopper of the ink fountain, to allow the ink to ooze out of the same when in the act of writing or marking, in the manner as herein, described.

To Frank Leslie, of Upper Rahway, N. J., for improvement in combined Table and Bedstead.

What I claim is, first, the table leaves, No. 2, in combination with the folding side pieces, for converting a dining table into a bedstead, as described.

Second, I claim the middle leaf of No. 1, with folding legs, in the manner and for the purpose described.

Third, I claim the construction and use of the movable towel frame of No. 2 in combination with the head board, as described.

Fourth, I claim the construction of the apparatus for washing stand and ottoman or support on the table, as described.

To Jacob Mumma, of Hummelston, Pa., for improvement in Seed Drills.

I claim, first, the combination of the plain pulleys, mouth pieces and slides operating as above set forth, for regulating the discharge of the grain.

Second, I claim the conical plates at the lower end of the tubes for distributing grain.

To M. S. Salter, of Newark, N. J., for process of making malleable iron direct from the ore.

What I claim is the process of manufacturing iron directly from the ore in a furnace composed of three combined chambers, one above another, all actuated by the same fire, whereof the upper chamber is used for heating and de-oxidizing, the middle chamber for fluxing and working, and the lower chamber for reducing and finishing the iron, substantially in the manner and for the purposes herein set forth.

To Elnathan Sampson and A. M. Billings, of Claremont, N. H., for improvement in connecting hubs with axles.

We do not claim confining hubs to axles by a spring catch on the one working in a groove in the other this having already been done; but what we do claim is the fastening a wheel hub to its axle by means of an annular groove near the extremity of the axle journal, and a sliding retaining plate and a spring guard pin, placed within the cap, made fast to the outer end of the hub; to wit, a curved portion of the said retaining plate, being forced by the spring into the groove, in the axle journal, and securely retained when in that position by the spring guard pin, substantially in the manner herein set forth.

To Augustine Smith, of Mobile, Ala., for improvement in Hemp Brakes.

What I claim in the above described Circular Indented Platform Mill, with horizontal surface, is the circular indented platform, with the application of the bevel indented roller or rollers, on this horizontal circular indented platform, which gives a coarser and a finer break, to suit any thickness of stock, from the coarsest hemp to the finest and most delicate flax, and that it is capable of being extended to any diameter, to receive any number of rollers of any desired weight, and to do any amount of business by the application of any motive power; and the model is intended to show simply the form and position of the bars on the platform, and the form and application of the rollers; viz., it is only intended to show the principle, and not the mechanism or most convenient mode of application, as the mechanism and mode will vary in almost every instance.

To Richard Swan, Jr., of New Bedford, Mass., for improvement in Sounding Board for Pianofortes.

I am aware that two sounding boards have been framed together, and confined to the framework of a piano; I do not, therefore, claim to be the inventor of a double sounding board; but what I claim is the combination of a sounding case with the ordinary sounding board of a piano (suitably perforated with sound openings) subtantially in the manner and for the purpose herein set forth.

To John E. Tucker, of Suffolk Co., Mass., for improvement in Welt Cutting and Splitting machines.

I claim the combination and arrangement of the two short cylinders, the knife, and chisel, arranged at one end of an ordinary leather splitting machine, substantially in the manner and for the purpose of forming strips of leather and cutting them into welts at one and the same time, and from larger pieces of leather, as specified.

To Thomas Dugard, of New York, N. Y., for improvement in Curvilinear Saw Mills.

What I claim is hanging the saw gate to slide in fender posts, framed together, and sliding horizontally to give the required lateral movements to the saw, substantially as described, when this is combined by rack and pinion, with a shaft and hands, wheel, or the equivalent thereof, under the control of the attendant, substantially as described. I also claim, in combination with the above described method of hanging the saw gate, to give it the required lateral movements, connecting the pitman or pitmen with the saw gate, by means of a horizontal rod or rods on the saw gate, and governing the upper end of the pitman or pitmen, by a guide or guides, aubstantially as described.

I also claim the method substantially as herein described, of vibrating the saw by means of a rock shaft or shafts connected there with and hung in the saw gate, in combination with the pulley or pulleys, or the equivalents thereof, through which the shaft or shafts slide, as described, the said pulley or pulleys, or the equivalent thereof, being combined with a crank handle or its equivalent, on some stationary part of the framing, as described. And finally I claim in combination with the rock shaft, or shafts, the vibrating saw guide connected therewith, substantially in the manner and for the purpose specified.

To S. D. Hopkins, of Brooksville, Va., for improvement in flood gates for fences.

I do not claim the barrel, or rollers and pulley, as my invention, when used separately, but what I do claim is the combination of all the parts, with the framework above described, so combined and applied as to produce the self-working flood-gate, as above described.

To John A. Robson, of New York, N. Y., for improvement in Sofa Bedsteads.

What I claim is the letting of the upholstered part of the back fall forward, to meet and rest against the rear or back edge of the seat, to form the bed without moving the sofa from its place, or disturbing any part of the frame, as herein described.

To Lorenzo Sibert, of Woodstock, Va., for combination of a double travelling hearth, with a blast furnace.

What I claim is the combination of the double travelling hearth, with a blast furnace, in the manner and for the purpose herein set forth.

To Thaddeus Fairbanks, of St. Johnsbury, Vt., for improvement in Platform Scales.

I claim the combination of the pivot or bearing frame, or primary platform, the blocks of rubber or spring contrivances, and the superior platform, with the weighing levers or mechanism; the whole being substantially in the manner and for the purpose, as specified,

RE-ISSUES.

To Erastus B. Bigelow, of Clintonville, Mass., for improvement in Looms for weaving Brussels Carpeting, &c. Patented March 13, 1849. Re-issued Nov. 20, 1849.

What I claim therein as new and for which I desire to secure letters patent, is, first, giving to the lathe of the power loom a countermotion, to vary the extent of its approach towards the face of the cloth at any required beat, to properly lay the filling to form the pile of the cloth, or clear the shed as above specified.

Secondly, moving the trough or grooved bar, which is employed to carry the pile wires under warps (or the equivalent thereof) forward towards the face of the cloth, to clear the shed as above described, or in any other way which shall accomplish the same end by substantially the same means.

ADDITIONAL IMPROVEMENTS.

To James D. Willoughby, of Chambersburg, Pa., for improvement in Seed Planters. Additional improvements annexed Nov. 20, 1849.

What I claim therein as new, is hinging the teeth to the frame or beam, and bracing them by flexible struts, which possess sufficient rigidity to resist all ordinary strains to which they are subjected, without flexing, but which suddenly yield and allow the teeth to turn back when they meet with an obstruction, which would otherwise break or stop the machine as described and represented.

Planing Machine Patent Cases.

(Continued from page 78.)

JACOB P. WILSON *vs.* DANIAL BARNUM.—In Circuit Court U.S., Eastern District of Pennsylvania. Issued directed from Chancery.

A mere change in the form or proportions of a machine will not constitute a difference of principle; but it is often difficult to say what is form and what is principle; and there is no subject on which witnesses of equal skill and knowledge in mechanics are more apt to differ.

The question for your consideration, as I have before stated, is one of infringement, and whether both or either of the machines used by defendant, and which now stand before you, infringe upon the machine patented by W. Woodworth, and described in his amended specification of 1845.

1st. Let us inquire what is the meaning of term infringement.

This, like the word previously noticed, will be better understood by describing certain things which are, and others which are not within, its meaning, than by any attempt at strict logical definition applicable to all cases.

"An infringement (Curtis, Sec. 220) involves substantial identity, whether that identity is described by the terms, "same principle" same "modus operandi" or any other. It is a copy of the thing described in the specification of the patentee, either without variation or with only such variations as are consistent with its being in substance the same thing.—What will amount to such a substantial identity cannot be stated in general terms—we can only look to individual cases for illustrations of the general doctrines."

"If the invention be a machine, it will be infringed by a machime which incorporates in its structure and operation the substance of the invention; that is by an arrangement of mechanism, which performs the same survice, or produces the same effect, in the same way."

"But if the difference between the two machines is not a mere difference of form—if there is a material alteration of structure—if there are substantially different combinations of mechanism to effect the same purpose by means which are really not the same in substance, then the one will not be an infringement of the other."

Where machines differ in form and structure, the jury should inquire whether they are only colorably different—that is whether they differ merely in the substitution of what are called mechanical equivalents or well-known analogous devices for the contrivances of the patentee. Therefore, if the two machines are alike in principle, if one man was the first inventor of the principle—and the other has adopted it, and though he may have carried it into effect by substituting one mechanical equivalent for an other, still you are to look to the substance and not to the mere form, and if it is in substance an infringement you ought to find that it is so.

But if, in any art, there be two well known distinct tools, machines, devices, or contrivances, which, as used, are defective in their operations, and A improves one, and B the other, so as to produce the same beneficial result, B's improvement cannot be called an infringement of A's, unless he appropriated the principle of A's improvement, or the one materially suggested the other. But if A's specification of the means or combinations used for improving his machine, cannot be practised or used for the improvement, they may well be considered distinct inventions, and the latter no infringement of the former.

(To be Continued.)

Extraordinary Sailing.

The steamer Canada made her last passage to Liverpool from this city in 11 days, and this with one engine—the other being rendered useless on her outward voyage.

Reduction of Telegraph Fare.

The directors of Morse's Line have had a meeting and adopted a resolution to reduce their charges.

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TO CORRESPONDENTS.

"E. Q. S., of Mass."—The elastic bag in the air chamber, to our knowledge, has been tried years ago. No patent, in our opinion, could be secured for your manner of working the piston. It is the same, essentially as that of the *wing* force pump, which was exhibited in this city three years ago by a mechanic from Ohio. The Piano Fire Engine comes nearest removing all the objections of Mr. Ewbank—the stroke is short from the breast, in an arc to the knee. We would advise you not to spend any money on the project.

"B. F., of N. H."—We have received yours and will give it due attention.

"F. E. E., of Mich."—The lathe referred to is not suitable for turning lasts. For information in regard to rights please address the inventor. No. 7 sent.

"A. J., of Greensboro."—A machine such as you want for turning spokes, lasts and gunstocks, can be purchased of A. R. Carter, of Newark, N. J. Mr. Alcott's is not suitable for that kind of turning.

"A. C. R., of Boston."—In Vol. 3 we gave free instructions, with plates, regarding the whole process of Electrotyping.

"W. D. A., of N. Y."—Next week about the Telegraph feat—a little too late for this number.

"W. B. T., of Syracuse."—Yours will appear next week.

"H. M. P., of Mass."—Your last has just come to hand.

"J. A., of Ala."—We will at a very early period collect and publish as much information as we can, upon the subject of Tanning.

"I. A. R. of Mass."—Upon the receipt of the model of your "balances," we will advise you fully in regard to their novelty.

"S. H., of La."—We can furnish you Vol. 4, bound, complete, at $2,75—but volumes 1, 2, and 3 cannot be supplied from this office at any price. Louisianna money taken at par. $1 received.

"G. W. D., of N. Y."—We have received yours. The screw is employed upon the principle of sculling, its form being adapted to act while revolving in the same way.

"T. A. R., of N. Y."—You had better not stand in the way of such a grouty man as the one who threatens you. If you do not use revolving cutters you can go on in spite of any body. We know of no good cheap machine hereabout for your purpose.

"A. H. N., of Mass."—We should like to know a little more about the invention you speak of. It is not clear to us. No speaking trumpet could convey sound to the distance stated by you: what is the plan? we must know that clearly, for we do not wish to speak about things we do not understand.

"S. T. S., of Mass."—There is no probability that any patent could be obtained for your system of propelling. Allen's plan failed in comparison with modern improvements,—and doubtless yours would, being, as you say, nearly the same.

"C. K. & Bro., Cincinnati."—Your request of the 14th will receive early attention. No. 44 has been sent by mail. We cannot furnish the back Vols. complete of the Sci. Am.—Vol. 4 is all we have. Glad to hear of Dr. C.'s safe return.

"J. R. W. of Ohio,"—The drawing and description of your Corn Sheller has been examined. The conical plate arranged on a vertical shaft and the fan blower, are very common devices, and could not be patented. The springs for holding the corn are not new, in fact we fail to discover sufficient novelty in your invention to warrant an application for letters patent. $4 received and credited as per request.

"A. H., of Ill."—We have received your papers and will attend to them without delay,

"T. C. M., of Ky."—The operation of your pump is very indifferently described, and we have been unable to obtain a clear understanding of its *modus operandi*. Pumps are very numerous and difficult to decide upon: our advice is that you send a model as soon as possible.

"H. & R., of Nantucket."—Your remittance came duly to hand, for which we are much obliged.

"B. S., of N. Y."—Your papers in relation to the bridge have been received. The Tribune, it seems, did not choose to notice your invention. The Committee at the Fair were perfectly blind in regard to bridges, as no mention was made of them. Very encouraging to the exhibitors to try again.

"C. L., Jr., of Conn."—The Vol. 3d sent you is the very last one that we have, therefore we cannot supply you with one complete. No. 1, Vol. 3, cannot be furnished, which we regret very much.

"W. J. H., of Ala."—Your letter in relation to machines for turning irregular forms, has been handed to responsible parties for attention. We had not the informatirn wanted.

"J. N., Dayton, Va."—The requests have been attended to, and Mr. D. of the Magazine will rectify the error. We have that assurance.

"D. McC., of Wisconsin"—Ranlett's Architect is now complete in 20 numbers Cannot be furnished for less than 50 cts. per number. Your numbers have been forwarded by mail.

"C. J. V. of Ohio."—Yours of the 13th is all right. Orders obeyed. Glad to hear from you often.

H. H. S., J. McC., J. A. H., T. W. S., A. H., J. P., and D. M.

Persons indicated by the above initicls are informed that their funds were received and the Camera Lucida shipped according to their respective orders.

The specifications and drawings belonging to individuals with the following initials, have been filed at the Patent Office since our last issue:

O. L. R., of N. H.; J. P. G., J. P., and H. S., of N. Y.; A. H. of Ill.; N. S. T., of Va. R. N. P., of Ga., and W. S., of O.

Money received on account of Patent Office business, since Nov. 23, 1849:—

O. L. R., of N. H., $25; J. P.G., of N. Y., $30; J. P., of N. Y., $50; B. S., of N. Y., $10; C. R., of Mass., $8; H. S., of N. Y., $20, and N. S. T. of Ala., $100.

Forwarding Back Numbers.

To save our subseribers the trouble of writing for the back numbers of the Scientific American, on Volume 5, we shall forward to all new subscribers the back numbers of this volume, so that at the end of the year they may have the volume complete. We shall pursue this course of sending the back numbers issued on this volume until No. 13, and after that time the names will be entered from the date of the reception of the orders, unless the writer expresses a wish to receive the back Nos.—in that case they will be promptly forwarded. It is desired that those subscribing, who are going to want the back numbers at all should order them at the time they send their names—and to insure their getting them, they are recommended to subscribe without delay.

Notice.

We refer our subscribers to No. 5 of this Vol. for particulars in relation to back numbers. We would also say, that whenever our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

ADVERTISEMENTS.

Patent Office.

128 FULTON ST.

NOTICE TO INVENTORS.—Inventors and others requiring protection by United States Letters Patent, are informed that all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

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THE PHRENOLOGICAL JOURNAL.—This Journal is a monthly publication, containing thirty-six octavo pages, at One Dollar a year, in advance. To reform and perfect ourselves and our race is the most exalted of all works. To do this we must understand the human constitution. This, Phrenology, Physiology, and Vital Magnetism embrace, and hence fully expound all the laws of our being, conditions of happiness, and causes of missery.

PHRENOLOGY.—Each number will contain either the analysis and location of some phrenological faculty, illustrated by an engraving, or an article on their combinations; also the organization and character of some distinguished personage, accompaied by a likeness, together with frequent articles on Physiognomy.

Published by FOWLERS & WELLS.
Clinton Hall, 129 and 131 Nassau-st., N. Y. 11 2m

THE WATER CURE JOURNAL FOR 1850.—The Water-Cure Journal is published monthly, at One Dollar a year, in advance, containing thirty-two large octavo pages, illustrated with engravings exhibiting the Structure and Anatomy of the entire Human Body; with familiar explanations, easily to be understood by all classes.

The Water-Cure Journal, emphatically a Journal of Health, embracing the true principles of Life and Longevity, has now been before the public several years. And they have expressed their approval of it by giving it a monthly circulation of upwards of Fifteen Thousand Copies. This Journal is edited by the leading Hydropathic practicioners aided by numerous able contributors in various parts of our own and other countries. FOWLER & WELLS, publishers,—Clinton Hall, 129 and 131 Nassau-st., New York.

Sample numbers Sent Gratis. j11 2m

THE MECHANIC'S ASSISTANT.—D. APPLETON & Co., 200 Broadway have just published the "The Mechanics' Assistant;" a thorough practical Treatise on Mensuration and the Sliding Rule, teaching the manner of Drawing all regular Superfices, and the most concise Methods of finding the Areas of all Regular Superfices, and the Contents of all Regular Solids, both by Numbers and by the Sliding Rule. Treating also of the Laws of Motion, the Descent of Falilng Bodies, the Strength of Materials, the Mechanical powers, the Elasticity and Force of Steam, Specific Gravities, Levelling, the Pendulum, &c. Adapted for the use of Carpenters, Shipwrights Wheelrights, Sawyers, Gaugers, Lumbermen, Students, and Artisans generally. By D. M. KNAPEN, A. M. 12mo, $1.

Also are prepared for Publication.

A DICTIONARY—Of Machines, Mechanics, Engine-Work, and Engineering—designed for Practical Working-men, and those Intended for the Engineering Profession—edited by Oliver Byrne, formerly Professor of Mathemajics, College of Civil Engineers, London, Author of "The Calculus of Form." To be completed in about 30 Nos., Price 25 cts. each. $1

STEAM ENGINES, second hand, one each 1 1-2 6, 8, 16, 20, and 80 horse power. New ditto 1 1-2 and 5 horse, on hand, and orders taken for any size.

Lathes new 5, 7, 8, 10, and 12 feet, the 8 feet lathe is a beautiful article, has back and screw gear, drill chuck, centre and follow rest, overhead reversing pullies, swings 19 inches and price only $ 200.

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THE SUBSCRIBER, late of the firm of Haldeman & Seitz, of Marrietta, Pa., formerly engaged in the manufacture and sale of Bridle Bits, has bought out Mr. Seitz in the whole Patent Right and stock on hand. Therefore he now offers to machinists, and dealers generally, the opportunity of buying low, the patent right for States, Counties or Districts in any part of the United States, for the remaining term of the patent right, the date of which is September 26, 1848. Persons buying rights can also be supplied with a small stock to commence the business upon at once, as he is still finishing up the stock on hand in the different styles of japaning, tining and plating. He will still supply the old customers in what stock they may want at reduced prices, until their neighborhood is supplied by new manufacturers.

Any orders either for rights, samples or information will be promptly attended to by

CYRUS S. HALDEMAN,
Bainbridge, Lancaster Co., Pa.

[See Engraving of the above Bit in No. 26, Vol. 4, "Sci. Am."] 9

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QUARTERMAN & SON,
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THOMAS PROSSER, Patentee,
m1 28 Platt street, New York.

EMPLOYMENT.—Pleasant and profitable employment may be obtained by a number of intelligent and active young men, in every County, by addressing postpaid, FOWLERS & WELLS,
Publishers.
129 and 131 Nassau-st, New-York.

P. S.—A small capital, with which to commence, will be necessary. Agents who engage in this enterprise will be secured from the possibility of loss.
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THOMAS E. DANIELS' PLANING MACHINES—Manufactured by HOWE, CHENEY & CO., Worcester, Mass. All orders for the above machines executed at short notice and satisfactory prices. 2 4m*

BARLOW & PAYNE, Patent Agents and Consulting Engineers, 89 Chancery Lane London
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ENGINE LATHES.—The Subscribers are now manufacturing, and have constantly on hand, an extensive assortment of the best patterns of Engine Lathes, which they offer at the following prices:—A Lathe 8 feet long, swing 19 inches, with back and screw gearing, drill chuck, centre and follow rest, $200; ditto, without screw gearing, $150; ditto, without fixtures, $125. For particulars of other sizes, address, (post-paid) SCRANTON & PARSHLEY, New Haven, Ct.

Munn & Co., Scientific American Office, are Agents for the above Lathes. Universal Chucks for sale at $15. 4. 3m.*

LAW'S NEW PLANING MACHINE—For boards and plank, is now in operation in this city—planing, tonguing and grooving at the same time, with rapidity and beauty. It is believed to be superior to any other machine, as it will do the work of two or three rotary machines, and for all Southern, and the majority of Northern lumber, the execution is much better.

Machines, with rights for States, or Counties, can be had by applying to the subscriber, at 216 Pearl street, or at Collyer & Dugand's mill, foot of West Fourteenth street, where the machine is at work.

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" " common,
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Jeweller's and pencil-case maker's, very superior.

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Instructions to Inventors can be had gratis, on application to Mr. THOMAS PROSSER, 28 Platt street, New York; as also the necessary forms of Petition and Declaration for British Patents.

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m1 tf 166 Fleet street, London.

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Scientific Museum.

Metalic Ore Veins.

Certain ores, whi ch contain the metals most necessary for man's use, are found in greatest abundance, constituting great masses in rocks of different kinds or distributed in lodes, veins, nests, concretions, or beds with stony or earthly admixtures. These precious stores occur in different stages of the geological formations but their main portion exists only in the primary strata, and suddenly cease to be found towards the middle of the secondary series; but iron the most necessary of all the metals, is found as high as the beds immediately beneath the chalk, when this ceases to exist, except as a mere colouring matter in the earth. The strata of gneiss and mica-salt are, in Europe, the great source of metallic veins. There is hardly any kind of ore which does not occur there in sufficient abundance to render their working profitable, and many metals are to be found only in these strata. The transition rocks and the lower part of the secondary series are not so rich, neither do they contain the same variety of ores. But this order of things which is presented by Great Britain, Germany, France, Sweden, and Norway, is far from forming a general law since in the middle and northern parts of South America, the gneiss, is but little metalliferous; while the superior strata, such as the clay-schists the sienitic porphyries, and the limestone, which complete the transition series, as also several secondary deposits include the greater portion of the immense mineral wealth of that region of the globe.

Lodes or mineral veins are generally distinguished by the English miners into four species:—1st, The rake vein, which is a perpendicular mineral fissure, and is the form best known amongst practical miners; it commonly runs in a straight line, beginning at the top of the strata, and cutting them downwards, generally farther than can be reached. The vein is sometimes found quite perpendicular; but it more frequently inclines or hangs over at a greater or less angle, or slope which is called by the miners, the hade, or hading of the vein. The bearing of the vein in this line of direction in which the fissure runs. 2ndly, The pipe vein which resembles in many respects a huge irregular cavern pushing forward into the body of the earth in a sleeping direction under various inclinations from an angle of a few degrees with the horizon to a dip of 45° or more. The pipe does not in general cut the strata across like the rake vein, but insinuates itself between them, so that if the plane of the strata be nearly horizontal, the bearing of the pipe vein will be nearly conformable; but if the strata stand up at a high angle, the pipe shoots down nearly like a shaft. 3rdly, The flat or dilated vein, which is a space or opening between two strata or beds of stone, the one of which lies above, and the other below the vein, like a stratum of coal between its roof and pavement; so that the vein and strata are placed in the same plane of inclination. These veins, like coal, are found interrupted, broken and thrown up or down by slips, dykes or other interruptions of the regular strata.—In the case of a metallic vein a slip often increases the chances of finding more treasure.—These veins do not preserve a regular thickness throughout like coal seams, but vary considerably in thickness even in a very small area.—4thly, The interlaced mass, which is the union of a multitude of small veins, mixed in every possible direction with each other, and with the rock. To these may be added the accumulated vein, a great deposit placed without any order in the rocks, apparently filling a previously formed cavern. Mineral veins are subject to derangements in their course, which are called shifts or faults. Thus, when a transverse vein throws out, or intercepts a longitudinal vein, and alters its direction it is called a shift, and this vein will generally be found again by following the interrupting vein on that side that makes an obtuse angle with the principal vein. When a fault occurs it is necessary to examine whether the strata be raised or depressed, and the vein may then be found again by mounting or descending accordingly.

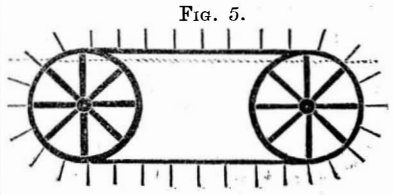
History of Propellers and Steam Navigation.

[Continued from page 80.]

MARQUIS DE JOFFRIE, RUMSEY, FITCH.

There seems to be some discrepancy in the accounts given of Jonathan Hulls' application of steam to propel vessels. Hebert, in his history, says that Hulls took out a patent for the application of the crank, whereas Hull's pamphlet, from which the engravings are taken, represent another plan than the crank, to convert a reciprocating into a rotary motion, to drive the paddle wheel. The engine of Hulls was single acting, and the application of a crank to it, has always been very difficult. as the ascending stroke has to be effected by a counterbalance, and an immense fly wheel, not suitable to the steamboat, is necessary, The single acting engine is not in any way adapted to navigation. After Hulls, the project of propelling vessels by steam power lay dormant until 1782, when a steamboat of 140 feet long, was tried on the Loire, at Lyons, by the Marquis de Joffrie. He used paddles revolving on an endless chain. It was unsuccessful.

FIG. 5.

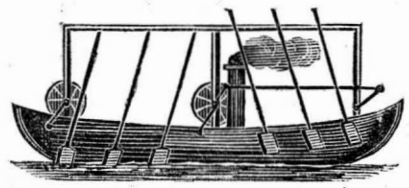


In 1784, Mr. James Rumsey, of Shepardstown, Va., made a private experiment with a steamboat, and in 1787, a public on the Potomac. Rumsey's boat was about 80 feet long, and was propelled by a steam engine which worked a vertical pump in the middle of the vessel, by which the water was drawn in at the bow, and expelled at the stern, through a horizontal trunk in her bottom. The re-action of the effluent water carried her at the rate of four miles an hour, when loaded with three tons, in addition to the weight of her engine of about a third of a ton. The boiler held no more than five gallons of water, and needed only a pint of water at a time; and the whole machinery did not occupy a space greater than that required for four barrels of flour.

Rumsey went to England, and after two years' preparation to get a vessel afloat on the Thames, died, just as he had completed its construction. This was in 1793. The vessel made several trips on the Thames against wind and tide, at the rate of four miles per hour. It was propelled by the re-action of water, like his first one on the Potomac.

The contemporary of James Rumsey was John Fitch, a man of great mechanical resources and inventive powers. He published the following description of his boat in the Columbian Magazine, December, 1786.

FIG. 6



The cylinder is to be horizontal, and the steam to work with equal force at both ends.—The mode by which we obtain a vacuum is, we believe entirely new, as is also the method of letting the water into it and throwing it off against the atmosphere without any friction.—It is expected that the cylinder, which is twelve inches in diameter, will move with a clear force of eleven or twelve cwt., after the frictions are deducted; this force to be directed against a wheel eighteen inches in diameter. The piston is to move about three feet, and each vibration of it is to give the axis (or shaft) about forty evolutions. Each evolution of the axis moves twelve oars, or paddles five and a half feet. They work perpendicularly, and are represented by the strokes of the paddle of a canoe; as six of the paddles are raised from the water six more are entered, (three on a side) and the two sets of paddles make their strokes of about eleven feet at each evolution. The cranks of the axis act upon the paddles about one-third of their length from their lower ends, on which part of the oar the whole force of the axis is applied. The Engine is placed in the bottom of the Boat, about one-third from the stern, and both the action and evolution turn the wheel the same way.

It is stated by Charles Whittlesley, Esq., in his pamphlet, "Justice to the memory of John Fitch," that the first model of a steamboat built by Fitch had side wheels, but the buckets of them were found to labor so hard under water that he adopted the plan of propulsion which we have represented above, and the construction of such a boat became to him the highest object of his ambition. The best biography of John Fitch is published in the Friend's Weekly Intelligencer, by Mr. Daniel Longstreth, of Warminster, Pa.,—he adheres to the point that John Fitch preferred the wheels, and adopted the paddles, which were patented by Henry Voight, once Chief Coiner of the U. S. Mint, at Philadelphia, and was one of Fitch's fund-holders. Between the two accounts there is a discrepancy, but none so far as it respects the wheels being attached to his first model. We are of opinion that Fitch preferred the paddles, as they were represented in his drawings, and also a model after he secured his patent in 1791. Fitch went to England in 1793, and was a disputant for public patronage with Rumsey. He was unfortunate in pecuniary matters, but had strong faith in the future *king-sway* of steam navigation.—He was an ill-used man, and should have received honors where he met with coldness and neglect. He terminated his life at Bardstown, Ky., by poison, in 1796.

(To be Continued.)

The Division of Matter.

Whatever exists is either material or immaterial. All that is material is an aggregation of separable parts and particles; the immaterial portion of existing nature comprises all living and thinking principles. A material thing is a compound; an immaterial existence, a single entirely. Such being the case, the subject of all philosophical inquiries must be either Matter or Mind.

Matter is that substance which affects the senses by sensible qualities; possessing cohesibility and infinite divisibility. It is either ponderable or imponderable. Light, caloric, and electricity, are the imponderables. All ponderable bodies are either organic or inorganic, solid or fluid, simple or compound. Inorganic substances are denominated minerals; organized beings, animals and vegetables.—The former are divisible into the metalic and non-metallic; and include the elements of matter. They are either elementary or the results of composition; being the elements themselves, or formed by their union. These are their divisions; non-metallic fluids, non-metallic solid elements, binary, haloid, and earthy, compounds, metals and metallic ores. The metallic elemental substances now number 43; the non-metallic, 16. Of these all things, visible and invisible, are made; but few, however, are essential to the frame-work of our globe. Organisms are the products of life, and formed by the combination of elements. We shall consider them as endowed with vitality, and constituents of animals or vegetables. The animal kingdom is sub-divided into four; vertebrata, articulata, mollusca, and radiata. The first includes the families: mammalia, birds, reptiles, amphibia, fishes; the second, insects, arachnida, crustacia; myriapoda, annelida, cirrhopoda, rotifera, entozoa; the third, cephalopoda, pteropoda, gasteropoda, conchifera, tunicata; the fourth, polygastrica, echinodermata, acalephæ, polypifera, porifera. All plants are arranged in two grand divisions: phenogamous and cryptogamous; subdivided into 21 classes, of which the former division includes 20: monandria, diandria, triandria, tetrandria, pentandria, hexandria, heptandria, octandria, enneandria, decandria, icosandria, polyandria, didynamia, tetradynamia, monadelphia, diadelphia, syngenesia, gynandria, monœcia, dicœcia. This is the alphabet of natural science; the grammar consists of such a knowledge of the divisions as will enable one to read the language of nature with understanding.

J. W. O.

"Up," and "Down."

When Columbus held out the certainty of arriving in India by sailing to the westward, on account of the earth's roundness, it was gravely objected, that it might be well enough to sail *down* to India, but that the chief difficulty would consist in climbing *up* back again.

LITERARY NOTICES.

GRAHAM'S MAGAZINE, December Number, W. H. Graham, New York, Agent.—It has been our custom to notice favorably the most prominent monthly magazines published in this country. We do so because they are a source of refined and intellectual pastime for the Ladies, whose tastes in matters of literature, as well as other things, should be catered for. The appreciation in which Graham's Magazine is held by them is certainly a high compliment to their discrimination and good sense. The present No. is richly adorned with chaste and elegant engravings. The papers are entirely original, by the best American authors. This Magazine commences a new volume January 1st.

PETERSON'S LADIES' NATIONAL, December No.—Terms $2 a-year.—This popular monthly closes its present volume in a style and beauty of arrangement not surpassed by any other magazine of the day. The engravings are beautiful—the contents varied and interesting. For 1850 the number of pages will be increased one-third, while the price will remain unchanged, except that eight instead of seven copies will be furnished for $10. The publisher announces that the January No. will be out in two weeks, and will be an annual itself.

H. Long & Bro., 43 Ann street, have just issued the romantic trial of MARY SCHWRIDLER, THE AMBER WITCH. Edited by Wm. Meinhold, a Doctor of Theology. The London Quarterly Review, in speaking of this work, says that "it is one of the very few works of fiction, of late years, which bears about it the unmistakeable marks of classicality." We think so, too, judging from a careful perusal. Price 25 cts.

In noticing Godey's Lady's Book, in our last No., instead of Messrs. Dewitt & Davenport being the Agents, it should have been H. Long & Bro.—the enterprising publishers above.

The third edition of the GRAEFENBERG MANUAL OF HEALTH, is now ready and for sale at No. 50 Broadway. The first edition was sold in a short time, which is an evidence of its appreciation by the public. A cursory glance through its pages satisfies us that it is a valuable family companion, and the price for which it is sold brings it within the reach of all. Price 50 cts.

EXPERIENCE IN WATER-CURE.—A familiar exposition of the principles and results of water treatment in the cure of chronic diseases, illustrated by numerous cases in the practice of the author; with an explanation of water-cure processes, advice on diet and regimen, and particular directions to women in the treatment of female diseases, water treatment in child-birth, and diseases of infancy. By Mary S. G. Nichols, Water Cure Physician. Published by Fowlers & Wells, 131 Nassau st., Y. N. Price 25 cts. The volume contains over 100 pages of clearly printed matter, and forms a valuable guide for family use.

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